



VOL. XXXI.

CLEVELAND, O., MAY 25, 1905.

No. 21.

DOCKING PART OF REPAIR EXPENSE

The assistant secretary of the treasury in charge of customs has addressed a letter to the collector of customs at Ogdensburg, N. Y., calling the attention of the latter to the fact that in assessing duties on repairs to an American vessel in a Canadian port he failed to include as a dutiable item the sum paid for the use of the dock. The treasury department's letter is in part as follows: "From your report addressed to the auditor for the treasury department it appears that you are under the impression that the department has abandoned its contention as raised in treasury decisions 23069 of May 22, 1901, that the cost of docking is a dutiable item, such belief being based upon the fact that in treasury decision 24932 of Jan. 25, 1904, the department in appealing from a decision of the Board of United States general appraisers of Dec. 31, 1903, did not specifically mention the fact that it adhered to its former contention as raised in treasury decision 23069, but laid particular stress upon the question as to whether the Board of United States general appraisers had jurisdiction to hear and determine protests involving the duty on repairs to American vessels in foreign ports, under section 3114 of the Revised Statutes.

"In regard thereto, I have to inform you that the department has not receded from the views held in treasury decision 23069 that the cost of docking is part of the expense of the repairs. The point raised in treasury decision 24932 as to whether the Board of United States general appraisers had jurisdiction is merely an additional issue. You are therefore instructed to reliquidate entry No. 2836 and to include the cost of docking as part of the expense of repairs dutiable under section 3114 of the Revised Statutes in the case mentioned."

NORTHERN NAVIGATION CO.'S STEAMER SARONIC

The steamer United Empire of the Northern Navigation Co.'s fleet has been remodeled during the winter at the plant of the Collingwood Ship Building Co., Collingwood, Ont., and in keeping with the company's policy to have the names of all its vessels end in "ic" has been rechristened Saronic. The fleet now consists of the Brittanic, Germanic, Huronic and Saronic. The Saronic is now one of the strongest vessels on the lakes. Her frames, keelsons and planking are all of the heaviest and best white oak. In addition she is strengthened by steel arches. On the main deck forward improved crew's quarters have been built and also a cold storage plant installed with capacity for two cargoes of perishable freight. The after part of the main deck has been fitted up with very superior accommodations for second class passengers. These consist of state rooms of three single berths each. The

steamer's saloons have been refitted and decorated. They are reached from the main deck by a new stairway leading from the passenger entrance. New hallways have been made from the saloon to the outer deck. The entire steward department has been located on the forward part of this deck but so completely shut off from the dining saloon that no odors can penetrate. The outer appearance of the steamer has been greatly changed by the construction of a turtle deck forward to accommodate the various changes enumerated above. On the promenade deck a large music room has been built, finished in quartered oak.

The steamer's boilers have been rebuilt and her engines completely overhauled. She has been fitted with two pole spars in conformity with the other ships of the line which give her a rakish appearance. Her officers are Capt. A. L. Campbell; chief engineer, H. Myler; chief steward, F. F. Bailey; purser, J. Bartlett.

SHALLOW DRAUGHT TUNNEL SCREW BOAT

An agent from a foreign country who has been in the United States for the past few weeks, has just placed an order with Marine Iron Works, Chicago, for a very unusual type of what appears to be a thoroughly practical, exceedingly light draught, powerful twin-screw steamboat. The first of these boats will be small (55 ft. long) made of galvanized steel throughout and fitted with two fore and aft compound condensing high-speed marine engines and a Roberts water-tube boiler, burning crude oil, allowed 250 lbs. steam pressure, the machinery being capable of indicating 70 H. P. The twin propeller wheels will work in tunnels of unique arrangement entirely different from the orthodox type of "tunnel boat." It is the opinion of the experts connected with the Marine Iron Works that the plan will prove very successful. As the boat will be launched and thorough tests made in Chicago, results will be watched with much interest. It will draw only 18 in. of water although 24 in. propeller wheels of special design will be submerged in their tunnels. In addition to very light draught and increased efficiency to the wheels, the tunnel arrangement provides against accident from snags or other obstructions, stationary or floating, in the rivers on which this and other similar boats are to navigate.

Work on the four ferry boats building for the city of New York by the Maryland Steel Co. is progressing rapidly at Sparrow's Point, Md. The Maryland Steel Co.'s plant is an especially busy place at present for work is also being hurried on the new floating dry dock for the Philippines. This dock will probably be floated about June 1.

LIVERPOOL SHIPPING LETTER

Liverpool, May 15.—In shipping circles in this country there is just now much attention being concentrated in the peculiar situation now existing in the North Atlantic trade. A letter dated May 9 has been addressed by the White Star and combined lines to the secretary of the North Atlantic Passenger Conference stating that in view of the withdrawal of the Cunard Line from all passenger rate agreements so recently arranged, on account of the refusal of the United States government to consent to the American line making a change in their New York mail service sailing day, the White Star, American and Dominion lines feel it necessary to be equally free from all agreements to enable them to protect themselves against any action that the Cunard Line may see fit to take which the lines named may consider inimical to their interests. Notice has thereby been given of the withdrawal of the White Star, American and Dominion lines from the conference, also a fortnight's notice from May 9 to withdraw from the first and second-class rate agreements, and three months' notice from May 9 to withdraw from the third-class British and Scandinavian agreements, and the third-class continental agreement. While in the opinion of the White Star officials this does not mean a renewal of the rate war, either in an open or even modified sense, it is understood in shipping circles that in all probability some serious complications may eventually arise. The opinion prevails in influential shipping quarters that the American line has acted throughout in a most reasonable spirit, for they were quite willing to fall in with the Cunard wishes, but the United States postmaster vetoed any such arrangement. Further it is recognized that the president of the combined lines, Mr. Bruce Ismay, has done his utmost to bring about an understanding. The German, Scandinavian and British lines also were willing, it is said, to adapt the passenger rate agreements recently arranged, but the Cunard Line stood aloof. It was felt that as the Cunard company had decided to remain outside and be in an independent position, no course remained for the combined lines except to withdraw from the North Atlantic Conference when they would be at liberty to take any action which might be necessary to protect themselves.

With reference to statements made by the White Star company in its circular above referred to, that the Cunard company have withdrawn from the passenger agreements, the public have been semi-officially reminded that Lord Inverclyde stated in his speech to the shareholders that the agreements were all dependent upon a condition which had not been fulfilled, and that there had been no withdrawal so far as the Cunard company are concerned, since the agreement fell to pieces automatically as soon as it became known that the condition in question was not to be carried out.

The facts concerning the West Indian mail contract about which so much feeling has been aroused both in Britain and her West Indian colonies, will be found in the following official statement made by the colonial secretary. Mr. Lyttleton points out that under the contracts which will expire on June 30 next, a total subsidy of \$422,500 per annum has been paid since Trinidad has been included in the main line. Of this sum the Imperial government has paid \$299,500, and the combined colonies \$123,000, so that to an overwhelming extent the Imperial government is the predominant partner. In these circumstances only the one tender of the alternative tenders which the Imperial government can accept should be submitted for the consideration of the colonial government. To invite the views of the colonial governments on offers which under no circumstances would be accepted by the British government would simply be to waste time and cause unnecessary irritation and debate. In the present instance pains were taken to ascertain the special requirements of the various colonies, and it was with a full regard to their interests that

tenders were invited and considered. Turning to the circumstances attending the recent call for tenders, Mr. Lyttleton explains that on Oct. 1 last only the Royal Mail Steam Packet Co. tendered, specifying an annual subsidy of \$500,000, as against the present subsidy of \$422,500. The government would only agree to this on condition that the excess was borne by the West Indian colonies, and as he knew most of them were not in a position to do this, he recommended that the contract should be allowed to lapse. Before the decision could be acted upon an offer was made by Elder, Dempster & Co. far more advantageous than that by the Royal Mail company, the offer in fact being not a specific sum, but to perform the service for such money as was at the disposal of the government. The postmaster general having determined to refuse the tenders of the Royal Mail company, it was open for him to at once accept the new offer, but in view of the length of time during which the Royal Mail company had carried the West Indian mails, and more especially in view of the fact that their tender had become public, it was resolved to again call for tenders. In answer to this four different firms tendered. One tender by the Royal Mail company was inadmissible, and their other tenders asked for a ten years' contract in place of the five and a half years specified. As they all contained extraneous conditions which the postmaster general could not accept, they could not be considered in competition with the tenders satisfying the essential requirement. Of those tenders, the most advantageous and which fully satisfied the conditions laid down, came from Messrs. Elder, Dempster & Co., and as time was pressing the best course was to intimate to the colonial governments that the Imperial government had accepted the Elder, Dempster tender, subject to no serious objection by the colonies, the alternative, as on the previous occasion, being the discontinuance of the contract. Meantime, the Royal Mail company offered to accept all the conditions with a subsidy not exceeding \$435,000 for five and a half years, and when Messrs. Elder, Dempster & Co.'s tender became public, they made the same offer for \$400,000, while later they offered a modified service on a ten years' contract for \$375,000. Mr. Lyttleton therefore warned the colonies that the tenders having been opened, the Imperial government could not be parties to further competition between the tenderers. The preponderance, so far as replies were received, was in favor of acceptance of the Elder, Dempster tender, but the opposition of two of the most important of the colonies was sufficiently pronounced, and the indications of unofficial feeling in the other colonies sufficiently unfavorable to lead the government to the conclusion that the safer course would be to discontinue the contract. Such inconvenience as may result must be attributed to the desire of the Imperial government not to thrust on the colonies an offer that is apparently distasteful. The colonies will in time, Mr. Lyttleton hopes, realize that they must not expect to prescribe to the Imperial government the choice of contractors, irrespective of the results of competition and the merits of the particular offers which competition has elicited.

Liverpool steamship owners have held a meeting to consider the Aliens bill, and have appointed a committee of passenger managers to draft amendments. These refer principally to the compulsory inspection and, if necessary, rejection as undesirable of American arrivals at Liverpool, as well as of continental departures. Owners are of opinion that the "undesirables" come wholly from the continent of Europe, and that it would be practically unheard of for an American passenger arriving in Liverpool to be rejected as an undesirable, or become chargeable to the rates; at the same time they resent the indignity to which American passengers would be subjected by an examination, all the more as this applies to second as well as third class passengers. It is feared the result will be to drive such passengers to the lines from continental ports, and so deal a ruinous blow at the influx of American passengers,

which is greater than the outflow during the season of second class voyagers.

It is announced here that the White Star liner "Cufic" has been fixed to sail from New York for Australian ports with cargo about the end of June. Hitherto goods from the United States for Australia have been quoted a through rate via Liverpool by the line, and the sailing of the Cufic, which is a large twin-screw cargo steamer of 8,250 tons gross, is the first direct White Star sailing for Australia from New York.

With the sailing from Liverpool to New York on Wednesday of the White Star liner Baltic, the new mail arrangements came into operation. It transpired that two mail sorters had been placed on board an American out-going liner for the first time on behalf of the British government. These, it is understood, will be associated with two American mail sorters who for the past two years have been employed by the American government in mail sorting. The two sets of officers—American and British—will, it is understood, co-operate with each other in eastward and westward mail operations. A special room has been provided close to the usual mail room, but otherwise no particular arrangements have been made or found necessary.

In the course of a paper read at the Northeast Coast Institution of Engineers on the damage done to boilers by oil scale, Mr. B. Morison pointed out that in passenger boats the source of danger is the auxiliary machinery, and particularly the deck machinery, which is often carelessly lubricated by inexperienced men, whilst in cargo boats the growing practice of using the main boilers for the working of cargo cannot fail to produce accidents unless great care is exercised and the necessary precautions adopted. In view of the fact that all marine engineers, and particularly superintendent engineers, fully understand and appreciate the dangers arising from oil in boilers, it is a mystery why a winch exhaust tank still continues to be fitted on shipboard. The office of this tank is to receive the exhaust steam from the winches, to separate the oily water therefrom for use as feed water in the boilers, and to allow the cleansed steam to be discharged up the waste steam pipe. It would be difficult to find a parallel to this system as an example of engineering folly. There is no justification, whatever, for the expenditure of capital to find such an apparatus, and any heat there may be in the comparatively small amount of oily water trapped in the exhaust tank is more than counterbalanced by the decreased efficiency of the heating surface in the boiler due to oily scale. The alternative is to employ an auxiliary condenser which condenses all the steam from the winches and other small engines. This system is universal in passenger steamers, and is now being rapidly recognized as commercially correct for cargo boats, as it results in economy of coal, better steaming and reduced boiler cleansing expenses.

PRIZE CAPTURES AT SEA

Douglas Owen has delivered a lecture before the Royal United Service Institute, London, England, recently upon "The Capture at Sea, Modern Conditions and Ancient Prize Laws." Enough of this lecture is reproduced below to show that the ancient prize laws were nothing less than piracy and even as late as 100 years ago high-handed things were done that would not be tolerated by the nations today. He said:

In 1657 they (the Spaniards) loaded us with treasure. We seized two of their galleons, a portion of the great Mexican silver fleet, so richly laden with gold and jewels that it took thirty-eight wagons to carry the treasure from Portsmouth to London, which it entered, we are told, with great pomp. The Spaniards were a naval bank to us. In 1702 we took from them in Vigo Bay fifteen huge galleons, the value of the prize being estimated at not less than £2,000,000 of our money. The great galleon captured by Anson in 1743 contained treasure worth £500,000. It was landed at Portsmouth, sent up to Lon-

don, and paraded in triumph through the city in a procession of thirty-two wagons, the ship's company marching with colors flying and band playing. Six years later we made a capture from the French—£300,000 in specie—which also was paraded through the city streets. Then, in 1761, came the great capture, the historic capture, of the *Hermione*, the Spanish treasure ship from Lima. The admiral and captains received as their share £65,000 apiece, the lieutenants £13,000, warrant officers about £4,000, petty officers nearly £2,000, and even the common seamen £500 per man. We all know the story of how the men, on arriving at Portsmouth, bought up all the watches in the place and fried them over the galley fire. On the outbreak of the war with Holland, in 1781, we captured at St. Eustatia, in the West Indies, a fleet of about 150 merchantmen, mostly laden with valuable cargoes. In 1796 two frigates and a privateer captured a Dutch fleet of immense value; out of seventy-two vessels, only three escaped. In 1799 four men-of-war captured off Cape Finisterre two Spanish treasure ships. So vast was the booty that when the prizes reached Plymouth it required sixty-three artillery wagons to convey it to the citadel. In 1804 we lay in wait for and captured two more treasure ships, of which the value was immense. I may remark that we were not actually at war with Spain at the time, but this was a secondary consideration. Then came the *Pallas's* great prizes in 1806. After capturing ship after ship on the way to Spain, freighted with diamonds, dollars and ingots, the *Pallas* sailed into Plymouth, each of her masts decorated with a massive golden candlestick, originally shipped at Mexico for some cathedral of Old Spain. No wonder that the king's navy and its friends ashore thought much of the possibilities of prize. Owners of privateers, too, and their crews, and the speculators sending them to sea, made numerous and splendid hauls. In 1778 the *Two Brothers*, of Liverpool, captured a French East Indiaman with a cargo valued at 2,000,000 livres or more. The *Amazon* in the following year captured and brought into Cork a Spanish galleon from Manila, "carrying the king of Spain's gold and silver," valued at about £1,000,000. In 1793 the *Pilgrim* captured a French East Indiaman with a cargo valued at £190,000. And so on. The excitement and the interest were constantly kept at the highest pitch, by capture big and little, whenever we went to war.

CAN AMERICANS BUILD DREDGES? YES

Editor Marine Review:—I note with interest the article in your issue of May 4 entitled "Can Americans Build Dredges?" I would answer most emphatically yes, and the fact that the parties referred to in that article went to Germany for their dredges is solely a matter of the personal predilections of the purchasers. One of the parties of the firm who purchased these dredges is a German engineer and contractor. Some American ship yards have not had the special experience in the design of different types of dredging machines, but that their construction facilities are adequate for anything that may be called for is undoubted. There are, however, engineers who have the requisite experience to design such craft, and this company stands prepared to design and furnish dredging machinery of any type, up to the largest size, and to suit any practicable conditions and to furnish the same complete under steam in any part of the world.

ATLANTIC EQUIPMENT Co.,

A. W. Robinson, Consulting Engineer.

New York, May 16.

The side-wheel steel steamer *Bristol* which is being built by the Pusey & Jones Co., Wilmington, Del., for the Newport & Providence Railway Co. was launched last week, the sponsor being Miss Gertrude Messig. The *Bristol* is 113 ft. long, 24 ft. beam and 11 ft. deep.

CAUSTIC LETTER FROM MR. BRUCE ISMAY

Mr. Bruce Ismay, president of the shipping combine, has sent the following letter to Lord Inverclyde:

Liverpool, May 9, 1905.

Dear Lord Inverclyde:—Your letter of April 28 is duly to hand, and I note the reasoning by which you reached the conclusion that the tentative agreement between the Cunard and International Mercantile Marine companies became null and void on April 15. It occurs to me, however, that the inability of the International Mercantile Marine Co. to obtain the consent of the United States government to the desired change in the sailing day of the American Line steamers, and the fact that I personally had no alternative to suggest, need not necessarily have brought about this result had it not been desired by the Cunard company, inasmuch as it was obviously equally open to yourself and your colleagues to make an alternative suggestion, or to have continued the mutually advantageous agreements come to, not only with the International Marine Co., but also with all other lines, leaving the sailing day question for further friendly discussion.

While the Cunard company is, no doubt, entitled to attach much importance to having the Saturday sailing day as clear as possible from competition, I would remind you that this question was not in any way connected with the withdrawal of the Cunard company from conference agreements in February, 1903—the change in the American Line's sailing day from New York only taking place in October of that year—and the Cunard company need not have made this an essential condition to its joining the other companies in ratifying the provisional agreements, in so far as these required ratification (one of them, i. e., the Scandinavian agreement, I think, you will find cannot be terminated until three months' notice has been given of your desire to do so, and until that period has elapsed). I therefore feel quite justified in repeating that the responsibility for what may now follow upon the determination of the Cunard company to relieve itself of all obligations to respect rates and conditions does once again clearly rest upon yourself and your colleagues.

While we have been content, in the interests of harmony, during the recent negotiations to make provisional arrangements for regarding Saturday as the "Cunard day," it is not without surprise that I observe you now definitely claim it as such in your letter under acknowledgement, for, I think, the Cunard company has in the past clearly placed itself on record as unwilling to recognize the right of any line to allocate to itself any particular sailing day. I have a letter before me from the late Lord Inverclyde to the late Mr. Ismay, dated Feb. 4, 1883, in which the former writes as follows in answer to Mr. Ismay's protest against the change of the Cunard's sailings from New York from Wednesday to Saturday (the latter being at that period the day on which the White Star steamers sailed from New York):

"The scheme of sailings, therefore, to which you allude has been considered and decided upon purely from a mechanical point of view, without the primary intention of following the example of others in infringing upon days of sailing which have been appropriated by different lines of steamships."

Similar reasons were alone responsible for the adoption, in October, 1903, of Saturday as the sailing day of the American Line from New York; while for the past twelve years Saturday has been their sailing day from Southampton. The view expressed by the chairman of the Cunard company twenty years ago has been more than once confirmed within the last two or three years by your general manager on occasions when Cunard Tuesday steamers have been fixed to sail on Wednesdays against the White Star steamers, and passengers have been booked for them in competition with the latter up to the last moment.

It is very greatly to be regretted that, in spite of repeated assurances to the contrary, the feeling should prevail that the existence of the International Mercantile Marine Co. is inimical

to the welfare of the Cunard company, as nothing could be further from the real fact; and this feeling has, I am convinced, been the cause of much unnecessary difficulty in maintaining those friendly relations between the two companies which are essential to both of them if the best results are to be achieved.

That the Cunard company should regard with so much distrust the existence of the International Mercantile Marine Co. and its affiliations with the United States seems to be not a little inconsistent, for you will doubtless recall the negotiations which were initiated in 1886 by the chairman of the Cunard Steamship Co. (the late Lord Inverclyde) for the formation of a company on very similar lines to those on which the International Mercantile Marine company is founded, and of which the Cunard and American lines were to form the chief component parts, to the exclusion of the White Star Line; and the chairman at that time expressed strongly the opinion that such an international combination would be regarded favorably in the highest political circles on this side. It is difficult, therefore, to understand why a similar combination should at the present time be, in the opinion of the Cunard company, of so menacing and detrimental a character, merely because the Cunard Line instead of the White Star Line is not included therein.

I would also remind you of the lengthy negotiations which you conducted in 1902 for the disposal of a controlling interest in the Cunard Steamship Co. to the syndicate then engaged in the formation of the International Mercantile Marine Co., and that the Cunard Line was not prevented from then becoming, and today being an important factor in the combination of steamship lines embraced under the title of the International Mercantile Marine Co. by any unwillingness on your part to sell, but only because you required the syndicate to take a larger holding of Cunard shares than they were willing to acquire, and because of your desire to obtain a higher price for said shares than the syndicate could see their way to pay.

Furthermore I must remind you of numerous offers made on behalf of the International Mercantile Marine Co. to co-operate with you for mutual protection and advantage, but by your refusal to avail of these offers, as well as by the repudiation of all working agreements, both as regards passengers and mails (inter alia, I refer to your letter of the 17th September, 1903, in which you peremptorily, and without any apparent justification, terminated the arrangement which had existed with the White Star Line for years, under which the west bound mail earnings were shared equally), by your recent refusal to co-operate in offering the British government a joint mail service based on a pool of the collective earnings therefrom, you have made it abundantly evident that the Cunard company prefers to remain in the isolated position of which you appear to complain, and in reference to which the sympathy of the public and press is appealed for upon every possible occasion.

I contend, therefore, that, having regard to what has passed, it is as unfair as it is ungracious on the part of those responsible for the conduct of the Cunard company to avail of every opportunity to endeavor to place the International Mercantile Marine Co. in an unfavorable light before the public; while, on the other hand, those representing the companies associated with the International Mercantile Marine Co. have remained patiently silent under much adverse and unfair criticism.

In view of the fact that the Cunard company is no longer a member of the North Atlantic Passenger Conference, I think it well to send for your information copy of letter which the action of the Cunard company has rendered it necessary Messrs. Ismay, Imrie & Co. should address to the secretary:—

Yours very truly,

(Signed.)

J. BRUCE ISMAY.

The Right Hon. Lord Inverclyde, 30 Jamaica street, Glasgow.

(Copy of enclosure referred to in the above letter.)

30 James street, Liverpool, May 9, 1905.

Secretary Smyth, North Atlantic Passenger Conference,
James street:

Dear Sir:—In view of the withdrawal of the Cunard Line from all passenger rate agreements so recently arranged, on account of the refusal of the United States government to consent to the American line making a change in their New York mail service sailing day, we feel it necessary to be equally free from all agreements, to enable us to protect ourselves against any action that the Cunard Line may see fit to take which we may consider inimical to our interests. We, therefore, hereby give notice of our withdrawal from the North Atlantic Passenger Conference; also, a fortnight's notice from today to withdraw from the first and second class rate agreements, and three months' notice from today to withdraw from the third class British and Scandinavian agreements and the third class continental agreement. Kindly notify the other lines, parties to these agreements, accordingly.

Yours faithfully,

(Signed.)

ISMAY, IMRIE, AND CO.

SITUATION AT BUFFALO

Buffalo, May 23.—The watchers for changes in the season outlook are finding a few snags here and there still, but these things are always in sight and must be expected. For all this the main prospect appears to be improving, just as some of our most far-seeing marine men predicted a month or so ago. One of the most certain indications of this is the fact that the tugs are doing well. This report is positive and it means not merely one thing, but two. There is a good movement of all classes of vessels, and business looks favorable enough to warrant a general taking of tugs, when if there was a losing trade the fleet would all be trying to crawl about in harbor without a tug to save a dollar here and there, regarding the time spent as of small account. Now the idea is to make the stay in port as short as possible, for there is something in sight to do.

I am also assured that there is no complaint yet of delay at the ore docks, which is, taken all together, the best report of all, as it means that there is not only need of the ore, but that there is no over-chartering or anything else that can give the ore shippers an excuse for hanging the vessels up for a week at the discharging dock, waiting for a chance to unload. When this waiting game is once the rule it is all day with the fleet, no matter what other conditions may happen to be. Buffalo passed the 100,000-ton mark of ore receiving last week, having come close to it the week before. This may not stand for much with the great ore-receiving ports, but it means for all that the steady development of an industry that is bound to grow fast. We are now shipping our own manufactured steel rails by the whole cargo up the lakes and as soon as the canal is in running condition again there will be a further increase of pig-iron shipment eastward.

The new Goodyear furnace has not yet received any cargoes of ore direct, but it was reported last week that there was no reason for waiting any longer. The bar that had formed at the mouth of the canal had been taken out, but some side work was still under way and it was felt that the thing to do was to wait till the canal was at its best and make a good start. The second furnace will soon be started up and that will mean the turning out of about 300 tons more of ore a day, that is, if the iron situation is held to be as favorable to the increase as it should be.

I still hear more or less inquiry as to the possibilities of the season, some business men apparently recalling the fact that by this time last season there was a decided quieting down of industrial matters all along the line. I came upon it first in connection with the movement of soft coal, which was by this time sagging off at a rate that was quite distressing to shippers

in that trade. What it meant was that the manufacturers of all sorts of goods requiring steam power were getting so few orders that they were running slow, not daring to pile up goods that might have to be sold at a reduction if there was not an immediate recovery in consumption. The recovery did come and it found the stocks comparatively low, so the boards are clear for a full season now. Besides we hear no complaint yet of a slowing down of the coal movement. They say that the iron ore movement is the great barometer, but soft coal leads it by a full length, for the manufacturer must begin to run slow before ore is affected and that means a dull coal trade.

There is a decidedly better demand for soft coal now than there was a year ago. It is true that there is so much more coal mined than is wanted that the prices are fully as low as they were a year ago, but that has nothing to do with the amount in use. Buffalo is not shipping much hard coal just now, but that cuts no figure in sizing up business quickly. Hard coal is a good deal of a luxury and sells more freely when money is plenty, but it is an after matter always, being a season behind other ups or downs in business. Our anthracite shippers have shipped their first water supply of the season and have turned their attention to rail-line trade, that is all. Soft coal is moving freely. Only a few days ago the Pennsylvania railroad authorities here found that their plan of dodging car service but letting soft-coal shippers hold their cars outside the city was working badly, as there were thousands of loads piled up there and the amount was growing fast, so they clapped on car service charges and the stock faded away in a short time. It would have taken months to move such a lot last spring.

There are other reasons for the confidence expressed in the season by the enlightened vessel owner. Nobody expects to make money at the rate so common a dozen years ago, when whaleback barge 127 could make a big percentage of her cost on a single cargo of flour, but the "no earnings" cry, so common last season, ought not to be heard much this season.

JOHN CHAMBERLIN.

INTERESTING POINT IN MARINE INSURANCE

An interesting point has been raised in a suit before Supreme Court Justice Burr of New York by Amos D. Carver and Joseph B. Morrell against the marine insurance brokerage firm of Walker & Hughes to recover \$13,176 that the plaintiffs claim is due them for the loss of the American four-masted schooner George C. Thomas lost in March, 1903, while on her passage from Conetable Island, Venezuela, to New York. The plaintiffs assert that in February, 1903, they commissioned the insurance firm to place insurance upon this vessel in the sum mentioned and they assert that the firm informed them on April 2 following that such insurance had been placed with London underwriters and issued a binder to the plaintiffs to complete the transaction. When it was known that the George C. Thomas was a total loss, plaintiffs, it is said, applied to the London insurance company for the amount of the insurance. The London house refused to pay, on the ground that they had not been informed of the sailing of the schooner from Conetable Island. Plaintiffs then brought suit against Walker & Hughes for damages in the full sum of the insurance applied for, alleging that it was the defendant's fault and entirely through their neglect to inform the London underwriters that the George C. Thomas had sailed. The vessel was almost new, having been built in 1902, and was regarded as a splendid one of her class.

Repairs to cost about \$1,000,000 and which will require more than a year's time are recommended by the naval board appointed by Rear Admiral Snow, commandant of the Charleston navy yard, to survey the armored cruiser New York. The cruiser is at present out of commission.



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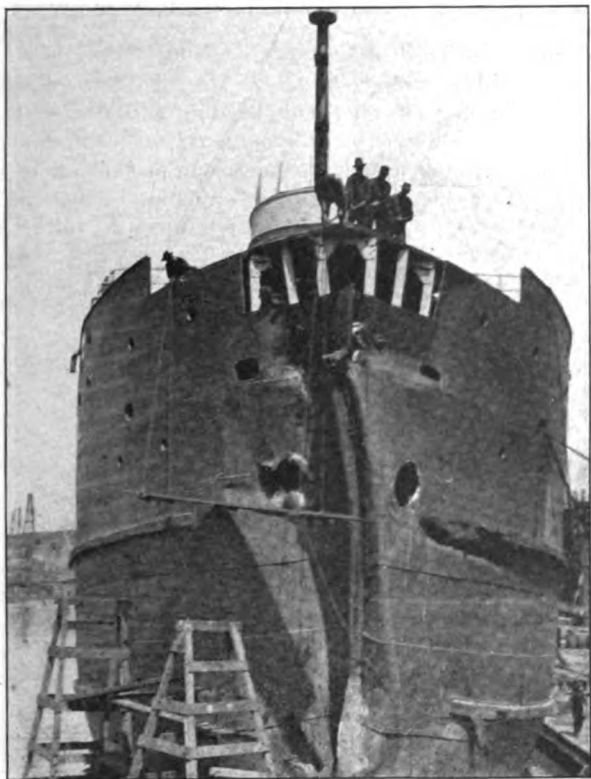
MAY 25, 1905.

Why should the government of the United States seek to evade the effect of laws from which its citizens cannot escape? The action of the Isthmian Canal Commission in deciding to buy two ships from Great Britain is indefensible. If the protective tariff policy has made it impossible for the American ship builder to build a ship as cheaply as it can be built abroad the government should be bound by that policy quite as much as the American ship owner is. It has no right to evade the consequences of its own acts simply because it has the power to do so. No one seriously questions the fiscal policy of this government. Under it the nation has prospered wonderfully. But it would be useless to deny that material is no higher in this country than in Great Britain or that wages are no higher than they are in Europe. Everyone knows that the contrary is true. Labor is paid a better wage in this country than abroad and a manufacturer pays a higher price for his material. How then can it be expected that a ship, which is the product of a hundred arts, giving more diversified employment than any other product of mankind, can be built as cheaply in this country as abroad. The government knows this very well; the administration which is committed of the settled policy of protection, knows it very well. Why should it, therefore, pursue so grossly unjust a policy toward American citizens who have in good

faith invested their money in ship yards of this country? It is understood that President Roosevelt has assumed all responsibility for the adoption of this policy by the Isthmian Canal Commission and has intimated that it is a question upon which congress, if it feels so disposed, should act. Congress would better act. If the American ship builder had been given the same chance that practically every other manufacturer in the United States has been given there would be no necessity of going to Great Britain for ships. But congress has left this one industry unprotected with the result that it cannot meet the competition of other nations. An inconsiderable amount of ship building is now under way in the United States, due absolutely to the neglect which this industry has received from the government. There is not a single ship building in the United States for the foreign trade and there is no prospect of any being built. This action on the part of the Isthmian Canal Commission may be a blessing in disguise for it may have the effect of stirring congress to action. At any rate a great many Republican leaders have already manifested their displeasure at the action of the Isthmian Canal Commission and the president's endorsement of it. One of them has even gone so far as to say that had congress advanced aid to shipping no such action would ever have taken place. What the government now, however, proposes to do, is to own foreign ships and to sail them under foreign flags. They cannot be sailed under the stars and stripes. What argument can possibly be advanced to excuse this action on the part of the administration? Are there not enough American ships in existence to take care of the commerce with this canal? Two ships that were built for ocean trade on the great lakes swung idle at their moorings in Brooklyn, N. Y., for more than a year and were sold a few months ago for less than half what it cost to build them. Does that look as though it was impossible to get ships? What right has the national government to go into the ship owning business in competition with its own citizens? Does any one pretend that freight will be more cheaply transported in these two imported and government-owned ships than it would be in the ships now owned by American citizens? The whole career of government ownership has been an extravagance and the people have been compelled to pay more than they would have paid had the work been done under private contract. When congress convenes on Dec. 1 one of its first acts should be to rescind this action of the Isthmian Canal Commission and to require the transportation to the canal zone of all products to be used in the construction of the canal in American bottoms. By such action only can faith be kept with American citizens, who have invested money in ship yards and ships and who are bound by the exactness of a protective policy to pay good wages and good prices for material.

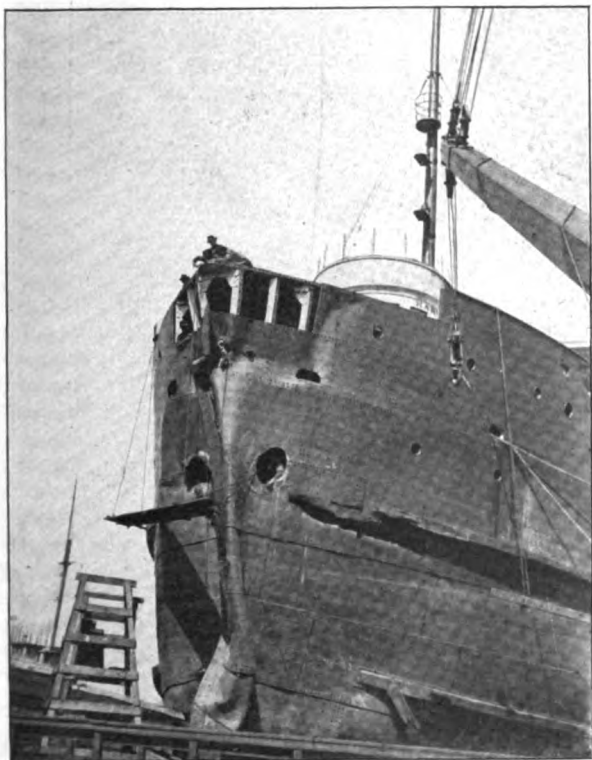
WRECK OF STEAMER HARVARD'S BOW

The steamer Harvard of the Pittsburg Steamship Co.'s fleet is now at the plant of the American Ship Building Co.'s Globe yard, in the old river bed, Cleveland, undergoing repairs



THE BENT STEM OF THE HARVARD.

made necessary by the collision with the steamer Thos. W. Palmer, off Standard Rock, Lake Superior, in a dense fog Tuesday morning May 23. The Palmer was practically cut in



THE HARVARD'S BATTERED BOW.

two by the collision and went to the bottom within five minutes, the crew climbing aboard the Harvard, which did not back out

of the break she had made until the men were safe. The stem of the Harvard is very bent, many frames were broken, both hawse pipes were pulled out and one stockless anchor lost.

This collision is likely to furnish ground for long litigation with the insurance companies on one side and the Steel Corporation on the other. The Palmer was insured for \$100,000, placed through the Detroit Fire and Marine Insurance Co. and distributed among a number of companies. Goulder, Holding & Masten of Cleveland have been retained by the insurance company and Hoyt, Dustin & Kelly of Cleveland by the Pittsburg Steamship Co. Capt. George F. Stilthen of the Palmer gives the following graphic description of the accident:

"The Harvard crashed into us on the port side between the second and third hatches, a little forward of amidships. The blow nearly cut us in two, and I called to the captain of the Harvard to keep her bow in the Palmer's side until my crew could board his boat. This he did. We sprang aboard without stopping to get our effects. When the Harvard pulled away, with a rush the water poured into the great hole in the Palmer's side, and she began to settle at the bow. She went down quickly. First the spars went by the board, then her smokestack, and then the cabins and the texas. As she settled lower the tremendous rush of water set her whistles going, and as she pitched forward and disappeared she was blowing a final farewell. It was all over in five minutes."

CONTRACTS FOR THREE NEW STEAMERS

Mr. Antonio C. Pessano, president and general manager of the Great Lakes Engineering Works, Detroit, Mich., closed contracts last week with the Jones & Laughlin Co. of Pittsburg for two steel freighters to be 530 ft. long, 56 ft. beam and 31 ft. deep. Both steamers are to be built on the arch type, the contract calling for double hull construction or what is commonly called the side tank, straight vertical side, the same as in the Wm. G. Mather. There is a provision, however, in the contract allowing the substitution of the Hoover & Mason type of boat in the event of a decision being reached by the Jones & Laughlin Co. at an early date to adopt that type. The Hoover & Mason will go into commission in a short time and the result of the initial experiment of loading and unloading with her will be known within a month. The Jones & Laughlin Co. are therefore wise in making the reservation. Should the Mather type of construction be used the hatches will be spaced 12-ft. centers. The steamers are to have triple-expansion engines, 24½, 39 and 67 in. cylinder diameters by 42 in. stroke, supplied with steam from two Scotch boilers, 15 ft. 6 in. by 12 ft., allowed 175 lbs. pressure. Both steamers are to be ready for delivery in the spring of 1906.

Mr. Pessano also closed contract this week with Mr. G. A. Tomlinson for the construction of a steel freighter for the Globe Steamship Co. of Duluth. This new freighter is also to be 530 ft. long, 56 ft. keel and 31 ft. deep, having triple-expansion engines with cylinders 24½, 39 and 67 in. diameter by 42 in. stroke, supplied with steam from two Scotch boilers 15 ft. 6 in. by 12 ft., allowed 175 lbs. pressure. It is also possible that Mr. Tomlinson will decide to change the type of construction to the hopper type or what is known as the Hoover & Mason design. This makes fourteen vessels that are now under order in lake ship yards for delivery in the spring of 1906, a condition which has never before existed on the great lakes. At this time last year every ship yard on the great lakes found itself practically without an order on its books and with mighty slim prospects of getting any. However, before fall they were well filled up and put in an unusually busy winter. But this policy of engaging berths practically one year ahead of delivery is a new experience altogether on the great lakes.

OVERHAULING THE CAR TRANSFER SOLANO

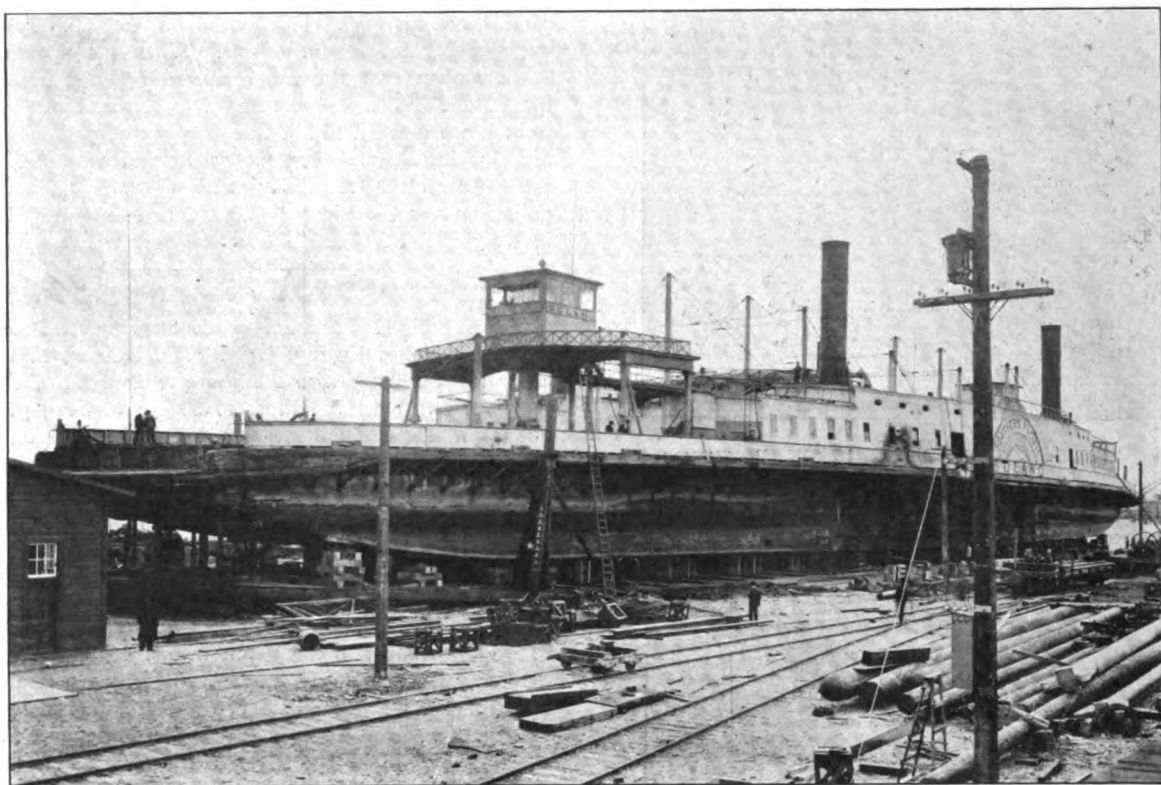
The Southern Pacific Railroad Co.'s immense train transfer boat, Solano, has for some time past been on the ways undergoing a very thorough overhauling. In fact, so complete are the repairs, that the work almost amounts to practical rebuilding of the craft. The Solano enjoys the enviable distinction of being the largest car transfer in the world. For years past the Solano has been in constant service, transferring trams to and fro across the Straits of Carquin, an arm of San Francisco bay. During all that time, the huge craft has never been in a drydock or undergone more than temporary repairs.

At length the condition of the Solano was such as to require her temporarily going out of commission and to undergo a complete overhauling. On Feb. 3 the enormous transfer was hauled out of the railroad company's great ways from Oakland creek. Notwithstanding the vessel's length, beam,

rods) extending down into the hull timbers, and keyed up to a high tension. By these braces both the upper and lower works are greatly strengthened.

Two large longitudinal bulkheads were built extending the entire length of the craft. These bulkheads are constructed in a very substantial manner—powerfully braced by steel rods. They are on each side of the boat—directly below the parallel double railroad tracks. There are ten bulkheads transverse, and in all, the Solano has thirty-three water tight compartments. In case of collision, or any other disaster, it would be a difficult matter for the Solano to founder.

From end to end, new and heavy flooring has been placed on the lower deck. There are four railway tracks the full length of the transfer. The old rails were taken up and replaced by new and heavy (80 lb. per yard) steel rails. The Solano can transfer at one load forty-eight large freight cars and a locomotive.



THE CAR FERRY SOLANO ON THE SOUTHERN PACIFIC RAILWAY CO.'S WAYS

weight and unwieldiness, it was safely and speedily drawn from the water.

Work of repairing was commenced at once. A force of about 300 men were employed, consisting of carpenters, machinists, caulkers, painters, iron workers and common laborers.

Repairing began simultaneously in all parts of the huge boat, and have been vigorously prosecuted for weeks. After the great hull was scraped free from the masses of barnacles, an examination showed the planking both above and below the water line to be in a perfectly sound and seaworthy condition. A strip of new planking some 8 or 10 ft. wide was laid all around the boat, extending above and below the water line. That was all the new work done to the exterior of the hull.

The entire hull was scraped, recalked and given a heavy coat of impervious paint. A great deal of work was done on the interior of the hull. New keelsons were added; two of these were 110 ft. long and two 95 ft. long—solid pieces of timber, each 24 x 26 in. A great deal of new bracing—steel and wood—was added, so as to strengthen the hull. To these were added four large posts with powerful "hog chains" (steel

The upper wooden works have been largely rebuilt. In taking out the old boilers and other ponderous parts of the machinery, it was necessary to tear away most of the wood work on the main deck, so it had to be rebuilt. New aprons have been built and also most of the heavy outside railing around the vessel. Every part of the great craft above and below, has been braced and strengthened, so that the Solano is now a much better and stronger vessel than when originally built.

The old side wheels were broken up and new ones built. These wheels are 30 ft. in diameter and 14 ft. wide. A new battery of eight boilers was installed. Each boiler has 138 tubes and two marine circular fire boxes, suitable for burning oil. However, by adding grates, coal may be used. Each boiler is 11 ft. in diameter and 12½ ft. long.

New engines were not installed as the old ones were found on examination to be in excellent condition notwithstanding their long, arduous and continuous service.

The work of rebuilding the Solano was under the general personal supervision of Capt. William McKinzie, the veteran superintendent of all the fleet of great ferry boats owned and

operated by the Southern Pacific system. He was assisted by Mr. H. Bruce, general superintendent of repairs.

The Solano is 424 ft. over all, 406 ft. 7 in. keel and 64 ft. 10. in beam. She has carried approximately 115,000 freight cars per annum.

MINNESOTA'S RECORD TRIP

The Great Northern Steamship Co.'s steamer Minnesota reached Seattle from Yokohama on her maiden trip of 13 days, 21 hours, 5 minutes. She is the proud possessor of the trans-Pacific record, having completed without accident of any sort her maiden round trip voyage from Seattle to the orient. She had 162 passengers and 7,036 tons of freight on her return trip. Capt. John H. Rinder, master of the Minnesota, had nothing but praise for his ship and the way in which she handled herself. The Marine Review was led to

time did not exceed 1,000 tons per boat, and I think the next largest to the Onoko carried only 2,000 tons. The Onoko proved too large for the trade at that time and lost money for the first two or three years because of not being able to carry full cargoes, owing to the shallow channels in the Detroit and St. Mary's rivers and at the Lake Erie dock. It was hard, at that time, to find any mine willing to take time to accumulate a cargo of 3,000 tons, and it was equally hard to get a Lake Erie dock at which she could conveniently unload and they could conveniently handle such cargoes. The sides of the boat were too high for the then existing unloading machinery and, as I remember it, it took about twice as long to load and unload this big boat as it did to do the same work on the next largest size, which was of about a third less carrying capacity; but, as the channels were deepened and dock machinery improved, she became a very successful carrier—has



PHOTO TAKEN AT MIDNIGHT OF APRIL 23, SHOWING THE ICE-BOUND FLEET IN WHITEFISH BAY. THE PHOTOGRAPH WAS TAKEN BY JOHN ZUNDELL, ON BOARD THE STEAMER CADILLAC.

publish a somewhat inaccurate statement concerning the result of this first trip which called forth a letter of correction from Mr. L. W. Hill, vice-president of the Great Northern Railway, of which the substance is noted above. In connection therewith Mr. Hill transmitted a letter which he had received from Mr. D. M. Philpin, assistant general superintendent of the Great Northern Railway at Superior. Mr. Philpin's letter which is of interest on the great lakes, was as follows:

"I doubt if the figures in attached clipping from the Marine Review are correct; but even if they are, I take it that they would not be discouraging. You may be interested in knowing that, when the steamship Onoko, 3,000 tons capacity, on an 18 ft. draft, was built in 1886, I was in charge of the Northwestern docks at Escanaba. The Onoko was the first big steel boat that was built and much larger than any others then on the lakes. The average tonnage engaged in ore trade at that

paid for herself over and over again and is still in successful operation in the ore trade, having loaded at our Allouez docks several times during the last few seasons. The Onoko was simply ahead of the times, and it is possible that your boats are in the same fix just at present and quite as likely that they will work out their own salvation in the usual way."

The Boston and Nova Scotia Steamship Co. has been organized with a capital of \$100,000. The plans of the new company are to inaugurate semi-weekly service between Boston and Halifax. The men identified with the enterprise are Mr. James A. Flanders, Milton, Mass.; John A. Gale, president of the Beacon Trust Co., Brookline, Mass.; Wm. S. Bangs, Newton, Mass.; Wm. E. Biddle, president of the Amesbury National Bank, Amesbury, Mass.; Alexander S. Paton, Leominster, Mass., and Washington Hoitt, Boston, Mass.

WORK ON HANNA COAL DOCK

Duluth, May 24.—Construction has begun on the coal dock to be built for M. A. Hanna & Co., which is to be on the bay front on the Wisconsin side of the line. The contracts for this dock are to be rushed, for it is proposed to fill it with coal this fall. Contracts have been awarded as follows: Dredging and filling, the Lake Superior Contracting & Dredging Co.; cribbing and timber work, the Barnett & Record Co.; hoisting machinery, the John E. Mead Co. of Vermont. There will be three of the well known Mead rigs, such as were put in some years ago on the P. & R. dock at West Superior and last year on the Zenith Furnace Co.'s dock at Duluth, and which are acknowledged to be among the fastest of any used. The timber contractors are already receiving material from the coast and are working nights and Sundays. The dock is to hold 200,000 tons of coal.

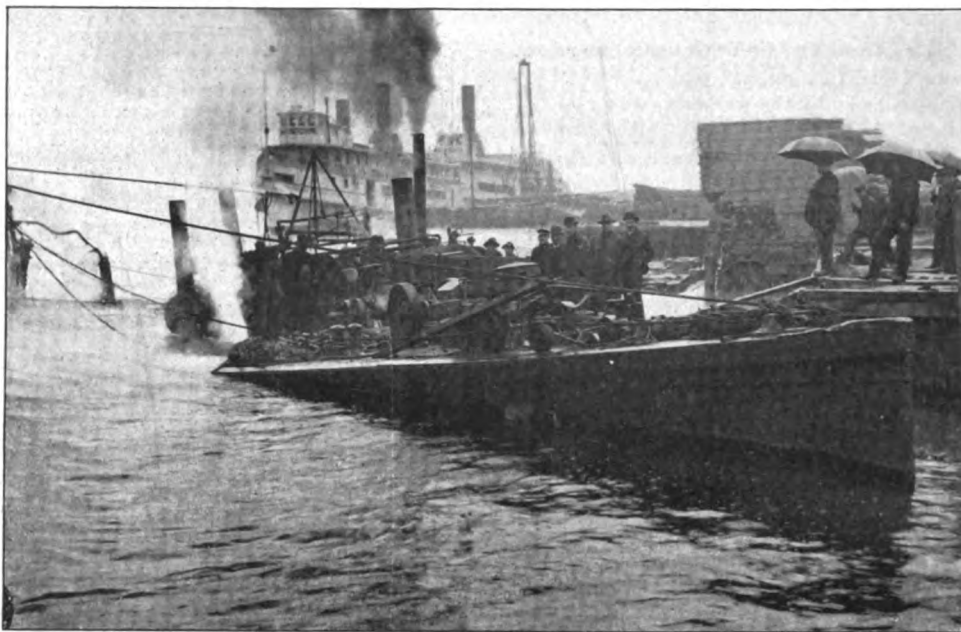
Grain receipts at the head of the lakes last week were but 55,000 bu., and shipments were 1,136,000 bu., making a sharp reduction in stocks on hand. There is little demand for wheat and the flour situation in the country is so bad that mills of the northwest are running only about half time, which cuts off very much the shipments of package freight by lake.

Line boats are taking wheat from the head of Lake Superior at 1¾ cents a bushel, while the freighters want 2 cents. As a consequence liners are taking most of what little is going forward.

The Booth Packing Co. expects to put on another passenger

and package freight boat for the local trade from Duluth to Lake Superior points, if this summer's business is up to expectations.

HULL OF THE GREYHOUND



AT WORK RAISING THE GREYHOUND.

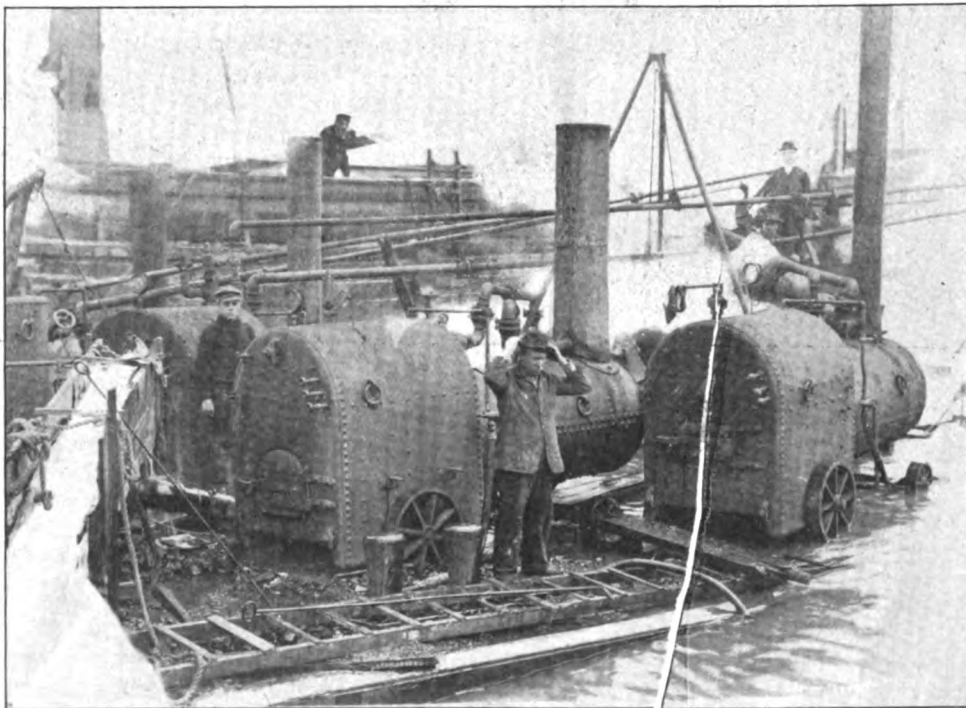
The hull of the old steamer Greyhound, long since used as a scow to carry Detroit street and alley sweepings, has caused no end of trouble since it settled to the bottom of Detroit river two months ago. Divers and steam pumps have been at work almost continuously, but the leaks in the old hull have defied their every effort to date, and the use of dynamite has now been sug-

gested to clear the mouth of the slip and free a schooner which has been imprisoned.

WORK AT THE IRON ORE MINES

Duluth, May 24.—Some of the Italian immigrants who are

arriving at New York nowadays are coming into Lake Superior, and the iron ore regions are receiving their share. Several carloads of these men have arrived at Hibbing and other towns on the Mesabi, and some are going to other ranges. More of them will locate on the Mesabi than elsewhere, as the opportunities for unskilled men are better than anywhere else in the lake region. About 100 men arrived at Hibbing on one day last



PUMPS AT WORK ON THE GREYHOUND.

week. This will assist in solving the problem of labor for the year. It was a serious matter, not so much in present, but in future, for the summer work is just beginning and there will be employment for many more men in the lake region in another

month than are now busy here. The mines may take no more, some stripping contracts are yet to be let and other jobs are yet to be started by mining companies direct; but the chief absorption of labor is coming from railway extension along the western Mesabi and other parts of the district. There have been none too many men for work doing, and with an additional call for large numbers they would have been a trifle too

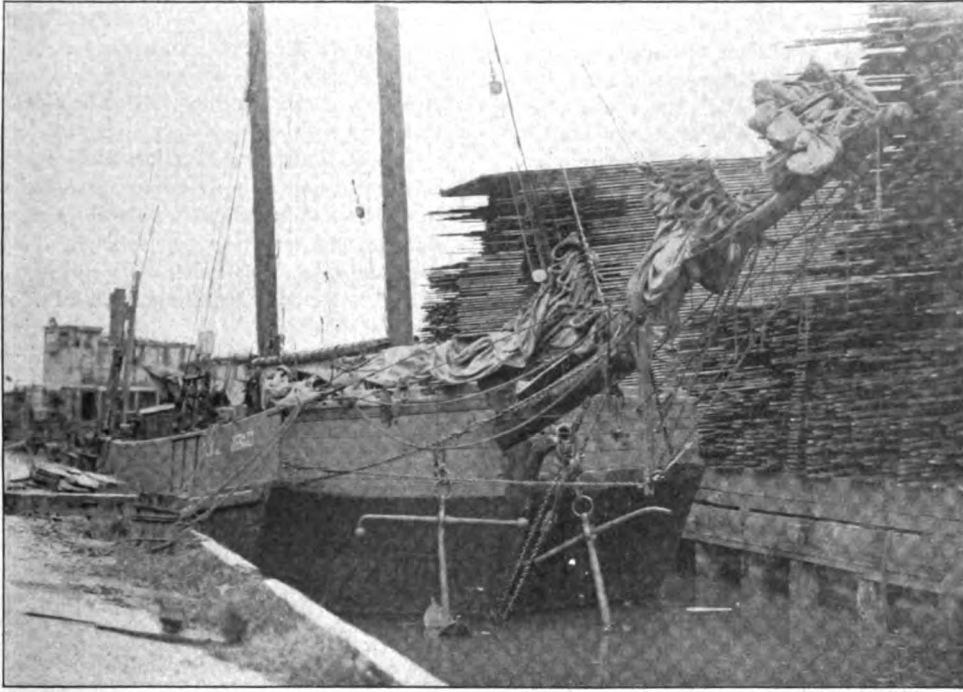
scarce for comfort. Unskilled men can be utilized both in railway work and in surface and open pit mines. J. C. Sullivan, president of the Western Federation of Miners, from Colorado, has taken the place on Lake Superior of an organizer named Keniston, and is attempting to organize the miners along the Mesabi. He has located several lodges, but the men are fighting rather shy of the federation proposition, as it seems to them largely a matter of paying out dues to the organization and they can find very little direct benefit for themselves. There is no sign of trouble over wages or other labor matters at any point on the various ranges, and the mining men can only hope there will be none.

Stephens mine, of the Oliver Iron Mining Co., has commenced shipment of ore to Two Harbors, and is sending out now about 4,000 tons a day. It is an open pit mine, equipped for very large operations, and has one of the immense ore bodies of the region, estimated at not less than 40,000,000 tons. The mine is under a 15-ct lease and is a good ore.

Jones & Laughlin are investigating several properties on the Vermilion range with a view to exploring there, and may decide to go into that range quite heavily in the near future. Vermilion ore is what all the steel companies want, but what none but one of them has so far.

The mine of the Mineral Mining Co. at Wauucedah, is to begin shipping as soon as the stripping is done, some time next month. Boiler and engine houses are completed and Capt. B. Martin, who for years has been with the Pewabic company, has been put in complete charge. The mine is the old Beta, and is owned by men interested in the Pewabic.

The shipment of ore from the Vermilion range to the works of the Dominion Iron & Steel Co. has commenced and promises to be as large as in any previous year. The steamer Neebing took the first cargo of the year a few days ago. These cargoes are limited by the depth of water and the size of locks in the Welland canal to about 2,000 tons, and it is a trade in which none but English ships can compete at a profit. The Welland lock permits the passage of a ship of not more than 255 ft. long, and there is supposed to be a draft available for vessels of about 14 ft., though it sometimes does not reach as high a figure.



THE SCHOONER NEWELL HUBBARD IMPRISONED BY THE SUNKEN GREYHOUND.

Work at the mines of the Mesabi is now normal, and the ore is coming out at the rate of about 3,500,000 tons a month. It is expected that ore receipts on Lake Erie, from all ranges, for the month of May will be in the neighborhood of 5,000,000 tons, which will be the record figure. On the Mesabi, in addition to the high rate of mining, there is stripping going on everywhere, and thirty or thirty-five shovels are now

working in that branch of the business.

TWO FORTHCOMING LAUNCHES AT DETROIT

Detroit is to have another big day in shipbuilding circles on Saturday. Two modern lake freighters, the *Superior*, a package freighter for the Western Transit Co., and the *L. C. Smith*, a coarse freighter for the Syracuse parties in the United States Transportation Co., will be launched, the first at the Ecorse yards of the Great Lakes Engineering Works and the *Smith* at the Wyandotte yards of the Detroit Ship Building Co. About six weeks ago Detroit had a double launching when the *Amasa Stone*, for Pickands, Mather & Co., was launched at Wyandotte and the *James E. Davidson*, for the Tomlinson interests was launched at Ecorse. The *Amasa Stone* is now in commission and has carried two cargoes and the *Davidson* will now be ready to go into commission within a short time. The steamer *George H. Russel*, launched at St. Clair, will be ready about the middle of June and the *Hoover & Mason* will go into commission in about a month. The *Anchor Line steam Delaware*, a duplicate of the *Muncy*, will be built on the berth vacated by the *Superior* on Saturday.

OBITUARY

Capt. George Radcliffe who sailed the lakes for many years and was widely known among marine men died at his home in Buffalo this week. He was eighty-one years old and had been in good health until a week previous to his death. Capt. Radcliffe had sailed the lakes until about twenty years ago when he retired to enter the employ of the Howard H. Baker & Co. He remained with this company until the first of the present year when his advanced age compelled his retirement.

The new steamer *E. H. Gary* building for the Pittsburgh Steamship Co. at the South Chicago yard of the American Ship Building Co. will leave South Chicago on Saturday of this week for Escanaba for her maiden cargo of ore. This cargo will be taken to South Chicago and as the steamer will be favored with deep water all the way it will undoubtedly be the record cargo of the lakes. It is expected that she will take on board 11,000 gross tons of ore.

CANADIAN SHIPPING NOTES

The Wabigoon Steamboat Co. of Wabigoon, Ont., is having a steamer built on the lake by Cassey & Long Toledo, O. The Midland Queen was the first steamer reaching Port Arthur, Ont., this season. She was also first in 1904.

Capt. W. A. Malloy, who for years was master of the City of Toronto, plying between Toronto and the Niagara river, and who recently carried on a summer hotel at Niagara-on-the-Lake, Ont., died there, April 27.

The old steamer John Instine, has been rebuilt and renamed the John Randall. She has been fitted with new compound engines; and is intended to run between Rideau canal points and Oswego, N. Y.

The steamer Montcalm, having been freed from the ice, by the floating out of the ice bridge at Cape Rouge, Que., has taken up a station in the Straits of Belle Isle, in order to warn

The Niagara Navigation Co. has arranged to inaugurate a freight service on its line between Toronto and the Niagara river during the current season of navigation. W. E. Tibbetts, Toronto, has been appointed general freight agent. The steamers of the company will make close connection with the trains on both sides of the Niagara river.

The St. Lawrence Floating & Wrecking Co. has been incorporated under the Dominion Companies' Act with a capital of \$200,000 and offices at Montreal, Que., to carry on a general salvage and wrecking business. J. W. Harris, T. Lessard, contractors; F. X. Durand, shipper; P. G. Martineau, advocate, and Jos. Durand, bookkeeper, all of Montreal, are the provisional directors.

Two companies have been registered under the Dominion Companies' Act with offices at New Glasgow, N. S., as follows: Wobun Steamship Co., capital \$48,000; Wasis Steam-



THE WHALEBACKS LYING AT THE PLANT OF THE GREAT LAKES ENGINEERING WORKS AWAITING REPAIRS.

incoming steamers of the state of the ice. She will remain on duty there until the ice has entirely disappeared.

The steamer Pierpoint has been chartered by the department of Marine as a light house tender to temporarily replace the burned steamer Scout. The Scout has been raised and will be reconstructed. The cost of this work is at present estimated at \$50,000.

The Dominion government has passed an order in council providing for reciprocity with the United States in regard to steamboat inspection. The secretary of commerce and labor will, in accordance with the powers vested in him, make a similar order in respect of Canadian vessels requiring United States inspection.

E. J. Chamberlin, general manager Canadian Atlantic Ry., J. W. Smith, also with the C. A. Ry., are among the provisional directors of the Colonial Lumber Co., just incorporated at Ottawa with a capital of \$100,000 to carry on in connection with a general lumber business a general navigation business.

ship Co., capital \$18,000. The directorate is the same in each case and includes G. Stairs, J. D. McGregor, J. C. McGregor, G. F. McKay and H. Graham, all associated with the Nova Scotia Steel Co. The two steamers named have been under charter to the Nova Scotia Steel Co. for its coal and iron ore trade.

The question of the renewal of the subsidy to Pickford & Black of Halifax, N. S., for a steamship service between Halifax and West Indian Island ports, will shortly be considered. The service is carried on by five steamers and the cost is \$150,000 a year. The Elder Dempster Co. of Liverpool, Eng., which is at present operating a refrigerator fruit service between Jamaica and other West Indian Islands and Bristol, Eng., is applying for the contract, as also is Pickford & Black.

The Richelieu & Ontario Navigation Co.'s steamer Canada, which was sunk after collision with the Cape Breton and subsequently raised, has been rebuilt at the Davis shipyards, Quebec. She is now at the company's yards at Sorel, Que., being refitted.

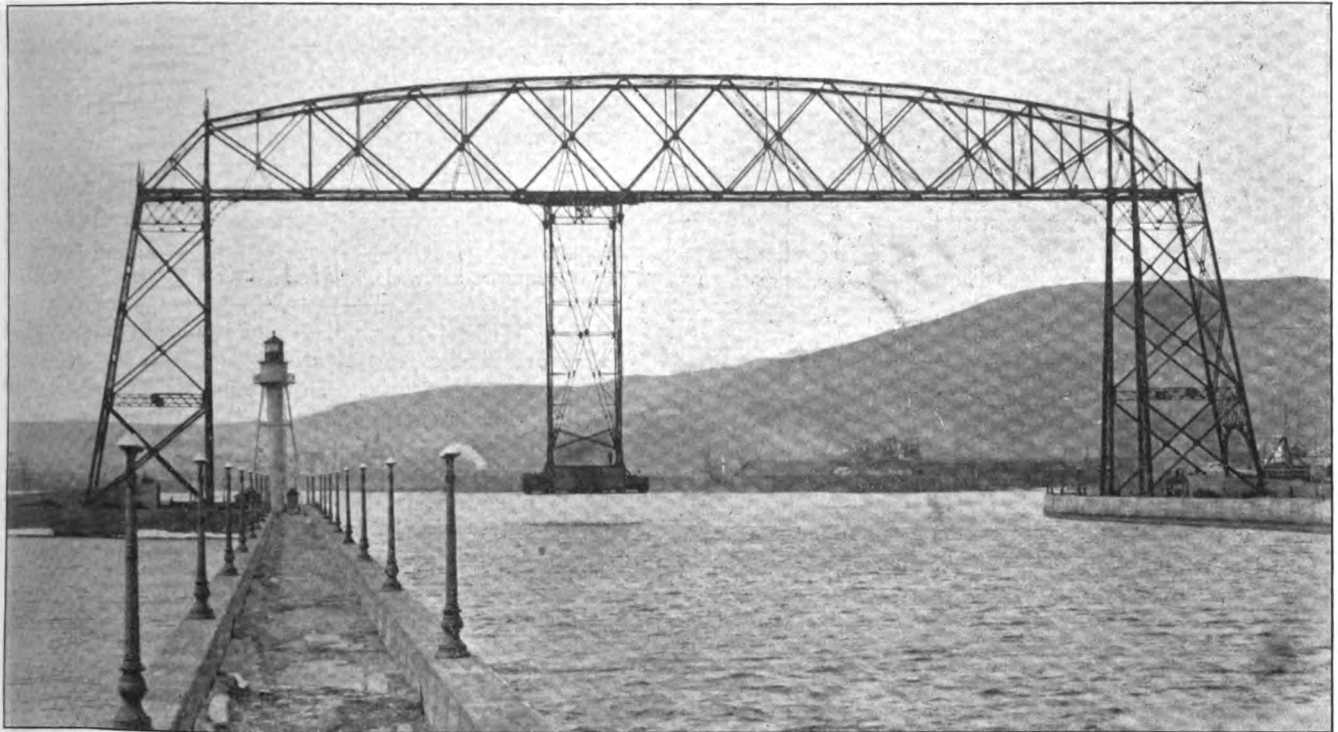
DREDGING AT LAKE PORTS

Buffalo, May 2.—There is a very good prospect of a liberal amount of work on the part of dredgers and breakwater builders at the lake ports in this government engineering district this season, not to mention some here that has been under way since last year. Drill boats are making night as well as day vibrant just below the Reading coal trestle, loosening up the rock for a basin 400 by 500 ft. which is right in place for the upper end of the ship canal that is to be built before long down the Niagara past the city, if present indications carry. The engineers are paying no attention to this work yet, as all they need to know is that the prescribed depth is obtained when the rock is cleaned out.

Buffalo and Erie also get a good slice of new development at government hands and Lake Ontario is down for more work, taken all together, than either of these har-

at the mouth of the creek and for quite a long way out if the inner harbor is to be kept open. This is to meet work already done further inside the harbor. Then there is a large amount of riprapping to be done to the lake side of the long breakwater, to fortify it against storms.

This last piece of work is to strengthen the old crib breakwater at various points, never to hold up the rubble mound part of the breakwater, which is not only the solidest structure in all the long barrier, but is by all odds the best thing in breakwaters. It took a lot of work and stone, but it is there to stay and is pronounced ideal wherever artificial means is needed to ward off storm waves. Had the entire breakwater been built in that way the engineering work on it would now be practically done. The first plan was to make a showing as cheaply as possible, so timber cribs were put down. These were sometimes moved by great storms and they always rotted away



THE NEW AERIAL BRIDGE AT DULUTH IN COMMISSION.

bors. When the season's improvements are finished at Erie that harbor will take quite a step forward towards the completion of the development that goes towards making it a desirable port for large craft to visit. On May 13 bids will be opened for the work of dredging out the entrance to the harbor, a work that has to be done year after year, as there is a constant sand drift past it, from what is said to be the Canada shore, and which used to change the appearance of the Buffalo lake front every year till the long breakwater cut it off. On May 22 bids will be opened for extending the south pier at Erie 500 ft. and for putting a concrete superstructure on the north pier 750 ft., completing the pier extensions at that point and bringing the south pier out as far as the north one is now. The basin inside is also to be dredged considerably. It seems to have become necessary to make such harbors as Erie full-depth or drop them entirely, as partial depths are little better than none unless the business done is in lumber and such shallow-craft operations.

Buffalo will begin with the opening of bids on the 13th for 336 ft. of concrete superstructure to the south pier, which runs from the life-saving station to the mouth of Buffalo creek. There is then a lot of dredging to be done

down to the surface of the water after awhile and had to be replaced. Then the plan of concrete superstructure was adopted, but even that does not approach the rubble-mound structure.

Lake Ontario as a whole gets more work than either Buffalo or Erie, but the harbors west of Charlotte appear to have been dropped by the government till there is some stir from the interior that demands better harbors. Wilson, Olcott and Oak Orchard still have their ambitions, but must wait. There is much talk of a coal railroad from Pennsylvania, especially that of the Goodyears, putting new life into one of those ports, but it is talk mainly so far.

There is new work to be done at Charlotte, Little Sodus Bay, Oswego, Cape Vincent and Ogdensburg. That at Cape Vincent, at the mouth of Lake Ontario, is of the most general character, being in the line of completing the harbor of refuge which was begun several years ago. This work will be done by contract, but it is likely that the government will do the rest itself, as it has the dredge and has usually put it into the small harbor work on Lake Ontario, as there is not business enough in it all to make it worth the while for dredging companies to keep up a plant for

the purpose of handling the work. Keeping up the piers and keeping the harbor mouths from filling in with sand is mostly what is done now. For Lake Ontario has Niagara Falls to thank for not being a real part of the lake system, commercially speaking.

The new work outlined in this article ought to cost something like \$350,000 and it shows that the government is quite liberal in its care of the great lakes, especially at points where work really counts.

JOHN CHAMBERLIN.

TWO LAKE LAUNCHES

The launch of the steamer Stephen M. Clement at the Lorain yard of the American Ship Building Co. on Saturday morning last marked another of the successful launches of this company. The Clement was christened by Miss Marion Cle-



THE LAUNCHING PARTY ON THE STAND.

ment of Buffalo, the sixteen-year-old daughter of Stephen M. Clement. She carried a beautiful bouquet of roses, the gift of the American Ship Building Co. The launching party consisted of Mr. and Mrs. Stephen M. Clement, Miss Marion Clement, Stewart Clement and Harold Clement of Buffalo; Wm. A. Roger, president of the Buffalo & Susquehanna Iron Co.; Hugh Kennedy, manager of the Buffalo & Susquehanna

nan. After the launch the party returned to Cleveland on special cars and went to the Union club for luncheon.

The Clement is building for the Buffalo & Susquehanna Steamship Co. of which Capt. John Mitchell of Cleveland is the manager. The steamer is a duplicate of the Ball Brothers and Philip Minch and is therefore 500 ft. over all, 480 ft. keel, 52 ft. beam and 30 ft. deep. She will have triple-expansion engines with cylinders 22½, 36 and 60 in. diameters by 42 in. stroke, supplied with steam from two Scotch boilers 13 ft. 9 in. in diameter and 11 ft. 6 in. long, fitted with Ellis & Eaves draft and allowed 180 lbs. pressure. The Clement will be commanded by Capt. Charles B. Galton.

The steel freighter Socapa, building for Mr. G. A. Tomlinson of Duluth was launched at the Bay City plant of the American Ship Building Co. also on Saturday afternoon. The Socapa was christened by Mrs. Samuel P. Cranage of Bay City. The launch was most successful in every way. The steamer is 524 ft. over all, 504 ft. keel, 54 ft. beam and 30 ft. deep and is equipped with triple expansion engines 22½, 36 and 60 in. cylinder diameters by 42 in. stroke, supplied with steam from two Scotch boilers, 13 ft. 9 in. by 11 ft. 6 in., fitted with Ellis & Eaves draft. The Socapa will have a carrying capacity of 9,000 gross tons of ore.

Shipments of iron ore from Vermillion mines have commenced for the works of the Dominion Iron & Steel Co., to Sydney, N. S., and the Neebing, with 2,200 tons, loaded at Two Harbors a few days ago.

G. A. Wieland of Duluth was the low bidder for the riprap work and timber removal at Ashland, Wis., the work estimated at about \$50,000. There were five bids, the highest \$1.29 and the lowest 79 cents.

The first iron ore for the Buffalo & Susquehanna Iron Co. whose plant adjoins that of the Lackawanna Steel Co. at Stony Point, was delivered at the plant this week by the Tomlinson steamer Sonoma. The ore came from Escanaba.



THE STEAMER STEPHEN M. CLEMENT IMMEDIATELY AFTER THE LAUNCH.

Iron Co. of Buffalo; Mr. and Mrs. James C. Wallace, Mr. Robert Wallace, Mr. Robert Logan, Mrs. Whitmarsh of Cleveland; Miss Lee of East Liverpool; Miss Marlowe and J. V. Lutes of Port Clinton; Capt. and Mrs. John Mitchell, Ralph D. Mitchell, J. P. Mitchell, Prescott Ely and D. J. Bren-

Unless traffic is interrupted the Detroit marine post office will handle more mail this season than ever before in its history. The volume so far this month is from 25 to 50 percent in excess of that for any previous May since the office was established.

THERMIT IN STEAMBOAT REPAIRS

The first actual application of thermit to steamboat work on the great lakes took place at Sault Ste Marie, Mich., May 1, when the rudder shoe of the tug S. C. Schenck was welded. The only other marine work on the lakes to which thermit has been applied was on two anchor stocks as tests at Chicago three months ago. The tug Schenck, owned by the Great Lakes Towing Co., backed on the rocks at the Dyke, St. Mary's river, last fall and lost the rudder shoe and rudder, rendering the tug helpless. There is no blacksmith shop in that part of the country at which the damage could be repaired and by ordinary methods the plating would have to be loosened and the stern post taken out. The Schenck was pulled out on a marine railway, the shoe and rudder recovered from the bottom of the river, wheel taken off and thermit applied to weld the break. A crucible containing 125 lb. was used, the weld was perfectly successful and the boat is in commission, a large amount of time and money being saved the owners.

Thermit is the name of a mixture of finely divided metallic aluminum and a metallic oxide, usually the latter is an oxide of iron. Thermit is the invention of Dr. Hans Goldschmidt of Essen-Ruhr, Germany, and is made in this country by the Goldschmidt Thermit Co. of 43 Exchange place, New York, N. Y. The inventor has made practical use of the peculiar properties of aluminum in heat absorption during the process of manufacture and his method of handling the material permits of the liberation of this stored heat during the formation of aluminum oxide. The reaction leaves the metal in a pure state, the heat generated being at a higher temperature than the electric arc. One of the most important services so far developed for thermit has been in the quick repair of broken shafting, rails, rods, etc., though it is adaptable for other industrial uses. The crucibles for the thermit reaction are conical and lined with a special magnesia compound. In the bottom is a tapping pin supporting a sheet iron disc covered with a piece of asbestos and having a small quantity of fireproof material tamped above it. The thermit powder is poured into the crucible so as to show a level surface on the top. In the middle of this is placed a pinch of ignition powder which is ignited by the application of a storm match—Bengal match—immediately after it has been struck. The chemical reaction is started at once and is complete in less than half a minute, whatever the size of the crucible. The result is a pure liquid steel which sinks to the bottom of the crucible and is covered by a perfectly distinct layer of aluminum slag. The iron is equal in weight to the aluminum slag but occupies only one-third of its cubic space. Its weight is half that of the thermit powder. After the reaction has taken place and the contents of the crucible subside, the tapping pin is lifted with a rod and the heated metal flows into

the mold surrounding the fracture in the shaft or whatever is to be united by the thermit.

FREIGHT SITUATION

With the exception of a little pounding that the coal trade is getting from one shipper the lake trade remains as it has

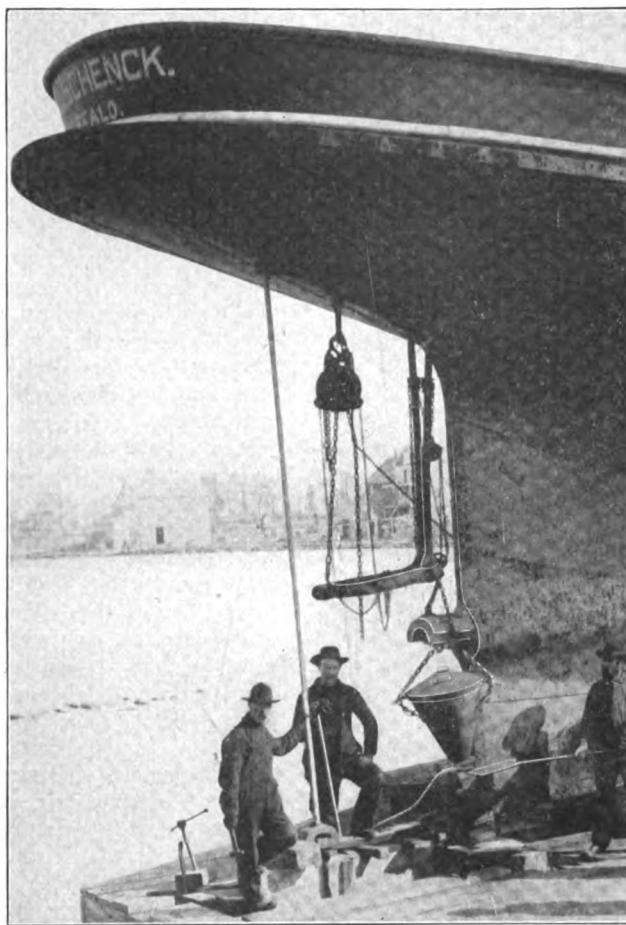
been since the beginning of navigation. Rates are being maintained on the opening basis though an unsuccessful effort has been made to break the coal rate five cents. Vessel owners cannot see, however, that a reduction in the rate will make cargoes any more plentiful and have refused to accept the cut. Chartering is light but it is expected that shipments will show a considerable increase next month when the Pittsburg Steamship Co. will be sending more coal to Lake Erie docks.

Ore is moving quite freely and the market is steady, though vessels are more plentiful than cargoes. Ore carriers are having excellent dispatch at Lake Erie ports with the result that they are getting to the upper lake ports a little faster than they can be handled. While no records have been broken in unloading the average record is better than it has ever been. In many cases big carriers are being worked out in a day. A new record was made this week at the plant of the Lackawanna Steel Co., Buffalo, when the steamer Walter Scranton with a cargo of 6,444 tons of iron ore was

unloaded in 7 hours and 20 minutes actual working time by two new electrically operated Hulett clam shell machines installed by the Wellman-Seaver-Morgan Co.

The three great shear legs at the Ecorse yards of the Great Lakes Engineering Works have been raised, and will soon be in operation. They are the biggest around the lakes. They are of steel, of which about 60 tons were used in the construction. The two front legs are 100 ft. long and the back leg is 135 ft. in length. The main hoist will lift 100 tons and the other 25 tons. On each front leg is a boom, each capable of lifting 2 to 3 tons. The legs will pick up boilers or engines from cars run underneath and drop them 30 ft. distant into the hold of a vessel. The legs have a "play" of 42 ft.

The steamer R. L. Ireland of the Gilchrist fleet was in collision with the steamer Empire City of the Pittsburg Steamship Co.'s fleet in Whitefish bay last week. The Ireland ran into her stern while in the ice fields. Her rail was broken off two feet on each side of the towing chock. Her shear streak was cut in two and two plates next to the shear streak were cracked. A number of deck plates will also have to be rerolled. The Empire City proceeded to Two Harbors and will bring down a cargo of ore and will probably be docked at Cleveland or Lorain.



THE MOLD AND CRUCIBLE READY FOR THE THERMIT WELD.

HOURS OF LABOR IN EUROPEAN SHIP YARDS

In connection with a report called for by the committee on labor of the house of representatives consuls of the United States have gathered and transmitted to the state department at Washington some interesting data as to the hours of labor in European ship yards. The reports from the more important ship building districts follow:

Bordeaux.—After April 1, 1905, the hours of labor per day will be 12 in the following cases: (a) In all factories using any form of inanimate power and employing only men of 18 years and over; (b) in all factories employing more than 20 men aged 18 years or more, and no women and children. In all factories employing less than 20 laborers, where no inanimate power is used and where only males over 18 years of age are employed, the hours of labor per day are unlimited. Children, girls under 21 years of age, and women are allowed to work in factories only six days in the week. The rest day need not be Sunday, and all the employes of any factory need not rest on the same day of the week. Men above 18 years of age may work on Sunday or any and all days of the week at their pleasure. The foregoing provisions cover labor in ship yards.

Havre.—In the engine and boiler construction shops the working day is ten hours each day, except Sundays, the year round, or 60 hours per week. The day is divided as follows: Morning, 6 to 11:30 A. M.; afternoon, 1 to 6 P. M.

In the mechanical and torpedo boat construction departments of the works of Augustin Normand & Co., of Havre, the length of the working day is 10 hours every day, except Sundays, the year round. The working hours are from 6:30 A. M. to noon and from 1:30 to 6 P. M. In other smaller private ship yards of Havre the working hours are from 7 A. M. to noon and from 1:30 to 6 P. M., making the day 9½ hours and the week 57 hours, although the men are paid as if they had worked 10 hours daily, or 60 hours per week.

Cherbourg.—In the government navy yard the hours of labor in summer, every day except Sunday, are from 7:30 to 11:30 A. M. and 1:30 to 5:30 P. M. In winter the working hours are from 7:30 to 11:30 P. M. and from 1 to 5 P. M. In other words, the working day consists of 8 hours winter and summer.

In the private ship yards of Cherbourg the working hours, six days a week, all the year round, are from 7 A. M. to noon and from 1:30 to 6 P. M., or 9½ hours per day, or 57 hours per week.

Marseilles.—Nine and one-half hours' work is required of the employes of the government arsenal at Toulon. The time schedule is complicated, the hour at which work begins varying from 5 to 15 minutes every ten days, according to the calendar. The work day begins at from 5:55 A. M. to 7:10 A. M. There is a cessation of labor of 45 minutes at noon for lunch.

At the works of the Societe des Forges et Chantiers de la Seyne, near Toulon, the summer workday consists of 11 hours, beginning at 5:30 A. M. and ceasing at 6 P. M., with 1½ hours at noon for lunch. The winter workday consists of 9¾ hours beginning at 6:30 A. M. and terminating at 5:30 P. M., with an interval of 1¼ hours for lunch.

At the shipbuilding plant of the Compagnie des Messageries Maritimes, at La Ciotat, a 9-hour workday has been adopted, or 54 hours per week.

At the plant of the Compagnie Francaise de Navigation et de Constructions Navales, at Arles sur Rhone, a 10-hour workday has been adopted, or 60 hours per week.

At the Chantiers et Ateliers de Provence, in Marseilles, 10 hours per day and 60 hours per week is the rule. Mechanics working beyond the limits of the plant or upon ships being repaired in the port have a 9-hour workday. The shipbuilding plant of this company has buildings at Port de Bouc, where the average workday is 10 hours, the schedule being

so arranged that a minimum of 9 hours constitutes the winter workday and a maximum of 11 hours the summer workday.

At the plant of the Societe Anonyme des Forges et Chantiers de la Mediterranee, at Marseilles, mechanics work 10 hours per day, with a recess of 1½ hours in summer and 1 hour in winter for lunch.

Hamburg.—There are in this consular district eleven prominent shipbuilding plants. In all of these establishments the time of daily labor is 10 hours—60 hours per week. Labor performed outside of the workshop, such as ship carpenters' work, is generally shortened half an hour or an hour in winter on account of want of light, making the average time of labor 9 to 9½ hours per day, or 54 to 57 hours per week. The time of labor varies from 6 A. M. to 5:30 or 6 P. M., including 1½ or 2 hours intervals for meals.

In case of rush of business or pressing repair work, overtime or night work is occasionally required, but there are no time regulations provided for such emergencies. In such event some laborers work 75 to 80 hours per week.

Stettin.—In the "Vulcan" shipyards, the largest concern of its kind in Germany, the working day is as follows: From 7 A. M. to 12 noon; 1½ hours for dinner, and from 1:30 to 7 P. M. Each morning and afternoon an extra pause of 10 minutes is allowed for lunch. These hours of labor hold good for the whole year and apply to those engaged by the week. Laborers doing piece work, that is, on the slips or docks, and not under cover, work from October 15 to April 1 about 1½ hours per day less than their fellow-laborers working under cover. During the summer months the situation is reversed in the open, the men working as high as 15 hours per day.

At the "Oderwerke" from April 1 to October 15, 11 hours per day; from October 15 to April 1 10 hours per day. As to piece work, the same conditions prevail as at the "Vulcan."

Belfast.—In this consular district all trades in connection with shipbuilding and engineering works labor 54 hours per week. The hours are made up as follows: On the first five days of the week the men work from 6:05 to 8:20 A. M.; from 9 A. M. to 1 P. M.; from 2 to 5:30 P. M.; on Saturday from 6:05 to 8:20 A. M.; from 9 A. M. to 12 noon.

Bristol.—The hours for all classes of labor in connection with the building of ships in Bristol are either 53 or 54 per week.

From March 1 to October 30 the daily hours are from 6 A. M. to 5 P. M. In November and February the hours are from 7 A. M. to 5 P. M. In December and January the hours of the skilled shipwrights are from 7:30 A. M. to 4:30 P. M.

At all times of the year one-half hour is allowed for breakfast and one hour for dinner. Work is stopped at 1 o'clock on Saturdays in ordinary shop work and at 12 o'clock on ships' work and what are technically called "marine jobs." In the two short months of the year the total weekly hours will not quite average 53.

Wages for shipwrights at present are 36 shillings (\$8.74) per week; for fitters on ordinary work in the shops, 38 shillings (\$9.22); on marine work, 41 shillings (\$9.97); for boiler makers, new work, 14 cents per hour; old work, 16 cents per hour, and for laborers 10 cents per hour.

Glasgow.—The daily and weekly hours of labor in shipbuilding plants in this district (including the districts of Troon and Greenock) are as follows: Monday to Friday, 9¾ hours per day; Saturday, 5¼ hours; total for the week, 54 hours.

In most of the plants these hours are shortened during part of the winter (usually about four months), and they then vary according to the exigencies of trade and the lighting facilities of the premises. In some cases the winter makes no difference, while in others the number of working hours per week may be as low as 35. The usual winter hours may be

stated as follows: Monday to Friday, $9\frac{1}{4}$ hours per day; Saturday, $4\frac{3}{4}$ hours; total for the week, 51 hours.

The figures given show the hours which prevail generally; in detail they work out as follows: Summer—Monday to Friday, 6 to 9 A. M., 10 A. M. to 1:30 P. M., 2 to 5:15 P. M.; Saturday, 6 to 9 A. M., 9:45 A. M. to 12 noon. Winter—Monday to Friday, 6:45 to 9 A. M., 9:45 A. M. to 1:30 P. M., 2 to 5:15 P. M.; Saturday, 6:45 to 9 A. M., 9:30 to noon.

London.—The British Board of Trade transmits a statement showing that 54 hours per week constitutes the hours of labor, exclusive of meal times, recognized by certain trades unions of London, viz.: Pattern makers, boiler makers and steel ship builders, shipwrights, ship joiners, ship plumbers and ship painters. This 54-hour week is divided into $9\frac{1}{2}$ hours per day for the first 5 working days, with $6\frac{1}{2}$ hours for Saturday, viz.: Monday to Friday, 6 to 8 A. M., 8:30 to 1 P. M., 2 to 5 P. M.; Saturday, 6 to 8 A. M., 8:30 to noon.

At the works, however, of one large firm (Thames Iron Works Co., Ltd.) the weekly working hours are only 48 hours per week.

The consul received a statement from the Thames Iron Works Shipbuilding & Engineering Co., Ltd., London, giving the labor rates paid in their shipyard and engine works. The hours are 48 a week, thus: Monday to Friday, 7:30 A. M. to 12 noon; 12:45 to 5 P. M.; Saturday, 7:30 A. M. to 12:30 P. M.

THE STEAM TURBINE

The D. Van Nostrand Co., New York, has placed upon the market Dr. A. Stodola's work "The Steam Turbine" with an appendix on gas turbines and the future of heat engines. This work was first published in 1903 but it is the second edition, which has been greatly amplified, that the Van Nostrand Co. is now publishing. In order to facilitate study the book is divided into three parts. In the first the principles peculiar to turbines are discussed. In the second are found investigations requiring more advanced mathematical preparation. The third part is greatly amplified and gives a short resume of the mechanics of heat, for there is no doubt that a thorough understanding of the energy transformation of a steam turbine can be gained only by having a thermodynamic foundation. To encourage the practical engineer, to freshen up the somewhat forgotten principles of thermodynamics, the fundamental laws of this science have been briefly derived for heat motors. The second edition, which is the one under review, differs from the first in the following details:

First, in the interest of readers who are in practical life, an elementary introduction to the theory of steam turbines has been undertaken, which avoids following the changes of heat conditions, nevertheless with the aid of empirical formulae takes into account a large part of the friction occurrences.

The larger part of the time at the author's disposal he spent in carrying out a series of experiments on the frictional resistances of turbine wheels in air, from which, with fair accuracy, the resistances in steam may be determined. These experiments have at least partially filled the greatest gap in the theory of the steam turbine, and have furnished a reliable foundation for the future analysis of experimental results. With the permission of Prof. Mollier of Dresden there has been added his excellent diagram of the heat contents of steam, exceedingly useful in turbine calculations.

A further addition that may be useful to designers just at present is the reports of the comprehensive experiments on the many stage impulse turbines of Zolty and Rateau. As the author was given full freedom in conducting his experiments, researches of a scientific character could also be made, and we might say that we know more about the performance of this turbine type under various conditions of running than that of any other system.

The immense strides made by the steam turbine in mechanical engineering enabled the author to present other reports

besides those on the Zolty turbine, namely on the new turbines of Riedler-Stumpf, Lindmark, Gelpke and Schultz.

An investigation of the influences which unequal heating exercises upon the stresses of disc wheels has been introduced because it is of special practical importance. A discussion on the marine turbine and its gyroscopic action seemed imperative. The critical number of revolutions of the second degree are derived in a simpler manner and the beautiful investigations of Dunkerley on the critical number of revolutions of shafts have been taken up. Turbine design has received special emphasis and has been illustrated with a number of wash drawings. The book is for sale by the Marine Review at \$4.50 per copy.

LAUNCH OF FERRYBOAT RICHMOND

The new State Island ferry boat Richmond was launched at the yard of the Burlee Dry Dock Co., Port Richmond, S. I., N. Y., on Saturday last. She is the only one of the five boats building for the city of New York to be constructed in a New York yard. The other four were put overboard a few weeks ago at the yard of the Maryland Steel Co., Sparrow's Point, Md. The Richmond when complete will have cost \$340,000. Her plans and specifications were made by Milliard & McLean, and A. Ingles was supervising engineer. The general dimensions are as follows: Length over all, 250 ft.; width of hull, 46 ft.; over all, 66 ft.; depth, $19\frac{1}{2}$ ft.; draught, 12 ft.; freeboard, $8\frac{1}{2}$ ft. The hulls are of steel, fitted with six watertight bulkheads. The upper works are of wood, except the engine and boiler casings and the fore and aft bulkheads dividing the passenger cabins from the wagon ways, which are of steel. The hold is given up entirely to machinery space and the necessary coal bunkers and water tanks. A collision bulkhead is at each end to take the stern tubes. The remaining space is divided into five compartments. In the centre are placed the two two-cylinder compound engines with crank shafts coupled together. On either side are placed two water tube boilers, fitted with blowers for forced draught, and opposite the furnaces are the coal bunkers.

On the main deck one cabin is for men and the other for women, and in each cross seats are arranged. One innovation is that the upper cabin cannot be reached from the men's cabin, the staircases on this side of the boat being at the ends and landing upon the open main deck. The upper cabin is fitted with cross seats, and 861 seats are provided. Passengers are to be admitted to this deck from the pier. The woodwork is of white pine and cherry. The boat has a seating capacity of 1,800. Her speed is expected to be 18 miles an hour, and the trip between the Battery and St. George should take about 20 minutes.

The four-masted schooner Augustus W. Snow was launched from the Stetson yard at Brewer, Me., recently. The Snow is 183 ft. long 36 ft. beam and 17 ft. deep. She has an exceptionally heavy frame. The main keelson is of four strakes of 14 by 14 in. with two smaller keelsons 12 by 14 in. each on either side. The lower deck has a full set of beams 12 by 14 in. and the lower hold has a 14 by 14 shelf strake tailed out with hackmatack knees and a 7-in. ceiling connected with 8-in. hanging knees. Her masts are of Oregon pine 90 ft. long and 25 in. diameter, and the top masts 15 ft. long and 17 in. diameter. She is fitted with a Hyde steam engine for handling sails and cargo and a Hyde steam windlass.

Charles P. Dee, a San Francisco ship owner, has bought the old whaler Newport and also the little steamer Maggie, which runs between San Francisco and Half Moon Bay. The Newport will be put into commission and will run between San Francisco and San Pedro, under command of Capt. Corning, formerly master of the Maggie. Before going on her regular run the Newport will carry 4,000 sheep to the Island of Santa Rosa off Santa Barbara, Cal.

NEW WATERWAYS ASSOCIATION

Within thirty days a conference will be held at Cincinnati, to which representatives from every waterway improvement association in the country will be invited, for the purpose of carrying out a plan for holding a National Waterways Convention during the early part of the next session of congress. On Wednesday, May 17, a meeting of the "On To Cairo" party, on board the steamer Queen City was held, as the boat was nearing Cairo, Ill., over which Col. John L. Vance presided, and the following resolutions were adopted: "Resolved, that for the purpose of inducing the government to adopt a more liberal policy for the improvement of the waterways of the country, the Ohio Valley Improvement Association be requested to invite within thirty days from the date hereof, representatives from every waterway improvement association in the country, and such other persons as it may seem proper to a conference at Cincinnati for the purpose of devising and carrying out a plan for holding a National Waterways Convention during the early part of the next session of congress."

Since 1827 the Ohio river in round numbers has received appropriations amounting to \$20,000,000, of which \$7,000,000 went for general improvements and \$13,000,000 for locks and dams. As the tonnage of the river averages about 15,000,000 tons annually, this is less than \$1.50 a ton. Other rivers that have been improved have fared much better. The St. Johns river of Florida, with a tonnage of 1,052,056 has received \$3,242,000, or at the rate of \$3.25 a ton. The James river of Virginia, with a tonnage of 608,180, has received \$2,372,500, or nearly \$4 a ton. The Cumberland river, Tennessee, with a tonnage of 601,900, has received \$3,366,420.13, or more than \$5.50 a ton. On the Black Warrior river of Alabama and its tributaries, \$3,716,000 has been expended, and its existing commerce proportionate to the expenditure does not compare with that already existing on the Ohio alone.

The canalization of the Ohio river, as already planned, provides for a system of locks and dams of uniform construction throughout its entire length. The locks are of single chamber construction, 600 ft. long and 110 ft. wide, of sufficient size to accommodate a steamer with a tow carrying a cargo of from 10,000 to 12,000 tons. The dams are to be moveable and 700 ft. wide. All of the locks and dams as now constructed can provide a nine-foot channel with little change and at no additional expense, and those already surveyed can be constructed to provide for their increased depth at practically the same cost estimated for the construction of a six-foot channel.

The work on the Ohio to the Pennsylvania state line is under the supervision of Maj. W. L. Sibert, located at Pittsburg. Locks and dams Nos. 2, 3, 4 and 5, located between lock No. 1 at Pittsburg and No. 6 at Beaver, Pa., is already under way, and from present indications they will be completed in Decem-

ber, 1906. The last appropriation provides for a nine-foot channel, and authority has already been given by the government for the engineering department to enter into contracts to complete the entire work. When this system becomes operative there will be a nine-foot boating stage, the year round, from Pittsburg to Beaver.

Maj. G. A. Zinn, located at Wheeling, W. Va., is in charge of Ohio river improvements from the Pennsylvania state line to the mouth of the Little Miami river. He now has under

construction locks No. 8, below East Liverpool, O., No. 11, near Brilliant, O., No. 13, six miles below Wheeling and No. 18, near Marietta, O. A provisional appropriation has been made for the construction of No. 19, near Parkersburg, W. Va., but nothing will be done until a report is made on the canalization to a 9-ft. depth. Work on the construction of No. 8 was be-

gun last July and the guide wall is partially completed and the cofferdam for the lock is about in place. The appropriation this year amounts to \$350,000, and will nearly complete the work. The work on lock No. 11 is at about the same stage as No. 8, and an appropriation of \$350,000 was made this year to carry on the work. The concrete locks of No. 13 have nearly been completed and the dam will be built this summer. The concrete work of No. 18 has been entirely completed and the dam is under way, but no appropriation has yet been made for the lock gates, power house, etc.

Authority has already been given for the purchase of four locks and dams on the Little Kanawha river in West Virginia, and which is under the supervision of Major Zinn. Lock No. 5 on this river was built by the government, but the remaining locks and dams are owned by a private corporation. These locks are badly maintained by these private interests, and when acquired by the government will be entirely rebuilt, the cost of which is estimated not to exceed \$300,000. This corporation not only collects toll on all products passing through during periods of low water, but exacts the same toll at flood stages when there is no necessity of operating the locks. The cost of acquiring this property is estimated at \$60,000 to \$75,000. The slackwater system on the Big Kanawha in West Virginia has been completed and consists of eleven locks and dams, affording a six-foot channel. The total tonnage carried on this river, consisting largely of coal, in 1903 amounted to over 1,500,000 tons.

By the combination of the partly slackwatered Muskingum river and the deepening of the Ohio canal a waterway will be provided from the great lakes to the gulf. The state of Ohio has already appropriated \$200,000 for increasing the canal depth to five feet, and it is estimated that an additional \$300,000 will complete the work, and this has already been promised by the state. The canal connects with the Muskingum at Dresden, O., and reaches the great lakes through the



"QUEEN CITY" PARTY LEAVING THE BOAT AT EAST LIVERPOOL, O., TO INSPECT THE LARGEST POTTERIES IN THE WORLD.

Cuyahoga river at Cleveland. The completion of locks 18 and 19 will afford an excellent harbor for the cities of Parkersburg and Marietta and will provide a channel throughout the year for craft coming from the upper part of the state by way of the improved system. Craft of 150 tons carrying capacity can operate on the canal when the depth has been increased to five feet.

Below Parkersburg the only dam in the great Ohio system now under construction is located seven miles below Cincinnati. It is No. 37 and the last on the river in the survey providing for the erection of 37 locks and dams on the Ohio from Pittsburg to Cincinnati. This work is under the supervision of Col. E. H. Ruffner, located at Cincinnati, and \$800,000 has been appropriated, which is sufficient to complete the work. The construction is such that a nine-foot stage can be provided without change in the plans already adopted. On the Big Sandy river in Kentucky, there are three locks and dams that afford a six-foot stage.

At Louisville the work is in charge of Capt. H. Burgess. No survey has yet been made for the location of locks and dams on the Ohio below No. 37 at Cincinnati, although the construction of only ten or twelve will be required to provide an open channel from Cincinnati to Cairo.

EXPLANATION OF LIGHT COAL SHIPMENTS

The almost complete demoralization of the soft coal business on the great lakes since the opening of navigation this season has been the subject of considerable speculation among vessel owners but the meetings of coal shippers from the Pittsburg, Hocking Valley and West Virginia districts at New York during the past week throws some light on the situation and to a great extent offers an explanation for the light coal movement so far this season. Pittsburg, Hocking Valley and West Virginia coal has always been the backbone, in fact, the only coal for the lake and northwest trade. The coal fields of Indiana and Illinois have within the past few years been enormously developed and are not keen competitors of the Pittsburg and Hocking Valley districts.

The big shippers from the latter districts have been in session with representatives of railroads handling the big coal tonnage to lake ports and, it is explained, have been trying to get a better differential from the railroads in order to enable them to meet the keen competition of shippers from the Indiana and Illinois coal fields, the products of which are shipped all rail to the northwest and upper lake ports. Several efforts have been made within the past week to pound down the lake carrying rate on coal but vessel owners seem to have a pretty thorough understanding regarding the maintenance of present prices as far as their rate is concerned.

With these conditions and the evident ability of intention of Illinois and Indiana coal operators to undersell shippers from the Pittsburg and Hocking districts and the all rail haul from the Indiana and Illinois districts as against the rail and lake haul from the Pittsburg and Hocking districts, where two handlings must be paid for, the request of the shippers for better rates from the railroads is a stand which means more than appears on the face of the statement; it means the providing of means with which to meet the active competition of the new fields and the starting of plants which, on account of an inability to meet competition in prices, have been idle and will probably remain so until a change of conditions is granted.

For the convenience of vesselmen and the delivery of orders at Sault Ste. Marie, Harvey's marine bureau have had a wire placed in the canal office at the Canadian Sault which connects direct with their office on the American side, thereby making it sure that telegrams and orders when sent in care of Harvey's marine bureau at that point will be delivered.

CHICAGO GRAIN REPORT

Chicago, May 24.—The past week of lake freighting at this quarter was one of extreme inactivity and rates accordingly unchanged at basis 1 cent corn Buffalo, Port Huron and Georgian Bay, and nominally 4 cent all water routing to Montreal. Both with shippers and vessel interests, the request is practically indifferent and some complete change in cash situation necessary to place this end in the figuring.

Shipments of the week aggregated some 3,000,000 bu., thus comparing favorably with week previous and the year ago, but it is noticeable that the quantity in movement all rail lines exceeds total of America and Canada routing via lake. This is probably occasioned through eastern interior demand ruling for less than cargo lots, because with the present going market prices (closely to 60 cent for May corn) export responses are decidedly slow.

The lake and rail shipments noted for this week were thus distributed: Via all rail lines of wheat 261,000, corn 435,000, oats, 690,000; via lake to Buffalo and other American ports, of wheat 250,000, corn 810,000, oats 250,000, and to Canada points via lake of corn 167,000 and oats 142,000.

Following is noted comparative figures of weekly shipments and grain stocks:

| Lake and rail shipments: | | | |
|---|------------|-------------------------------|----------------------|
| | This week. | Last week. | Same week last year. |
| Wheat | 515,207 | 430,005 | 448,357 |
| Corn | 1,420,429 | 1,061,959 | 1,942,791 |
| Oats | 1,082,389 | 822,084 | 997,395 |
| Rye | 8,500 | 9,784 | 15,173 |
| Barley | 65,976 | 65,792 | 62,557 |
| | 3,092,501 | 2,389,624 | 3,466,273 |
| | | Shipments since Jan. 1, 1905. | Same time last year. |
| Wheat | | 5,346,257 | 4,917,504 |
| Corn | | 31,490,948 | 19,121,860 |
| Oats | | 18,514,001 | 19,069,813 |
| Rye | | 523,571 | 699,297 |
| Barley | | 2,124,904 | 2,434,938 |
| | | 57,999,771 | 46,243,412 |
| Stocks in private and public elevators: | | | |
| | This week. | Last week. | Same week last year. |
| Wheat | 2,992,000 | 3,628,000 | 3,733,000 |
| Corn | 2,837,000 | 3,546,000 | 5,203,000 |
| Oats | 3,770,000 | 4,268,000 | 2,318,000 |
| Rye | 130,000 | 121,000 | 436,000 |
| Barley | 20,714 | 50,714 | 243,000 |
| | 9,749,714 | 11,613,714 | 11,933,000 |

PERSONAL

Capt. W. D. Ames will command the new steamer Hoover & Mason.

Commander Fox assumed his duties as lighthouse inspector of the ninth district, succeeding Capt. Herbert Winslow last week.

E. M. Ashley, who has been superintendent of the Councilman elevators since they were built ten years ago, has resigned.

Capt. F. N. Danger of the steamer F. L. Hopkins, fell down the pilot-house steps of his steamer last week and seriously injured himself. He was removed to the St. Joseph hospital at Lorain.

Mr. Gilbert Patterson of Superior has been appointed chief engineer of the Tomlinson fleet with headquarters at Duluth.

Mr. Paul Morton, the secretary of the navy, has resigned from the president's cabinet.

Wm. H. Gillen of Milwaukee was the lowest bidder for completing the government piers and breakwaters at Milwaukee for which \$155,000 was appropriated. The Gillen bid was \$111,837.

OUR MERCHANT MARINE

By Walter J. Ballard.

The 1904 annual report of Eugene T. Chamberlain, United States Commissioner of Navigation, gives the merchant marine of the United States, including all kinds of documented shipping, as comprising 24,558 vessels, of 6,291,535 gross tons. The year's growth was only 133 vessels, of 204,190 gross tons. The 1904 figures do not include 1801 yachts of 78,452 gross tons, as they are not engaged in trade.

Against our 24,558 trading vessels, of 6,291,535 gross tons, our chief exporting competitors, Great Britain and Germany, make the following showing for 1903:

| | Vessels. | Gross tonnage. | Increased tonnage. |
|---------------------|----------|----------------|--------------------|
| Great Britain | 36,406 | 17,340,837 | 420,950 |
| Germany | 6,153 | 3,704,607 | 201,146 |

British and German shipping is almost wholly engaged in foreign trade; the increase in American registered tonnage was only 9,992 gross tons. Comparing the American merchant shipping of 1904 with that of 1892, we have as follows:

| American, tons | 1892 | 1904. | |
|----------------------|-----------|-----------|-----------|
| Foreign trade | 977,624 | 888,628 | 88,996 |
| Sea Fisheries | 86,524 | 67,743 | 18,781 |
| Coasting trade | 3,700,773 | 5,335,164 | 1,634,391 |

The only bright spot in this record is the 1,634,391 increased tonnage in our protected coasting trade.

Our 24,558 vessels (1904), with their 6,291,535 gross tonnage, are distributed as follows:

| | Number. | Gross tonnage. |
|-------------------------------|---------|----------------|
| Atlantic and Gulf Coasts..... | 17,330 | 3,244,928 |
| Northern lakes | | |
| Pacific Coast | 2,542 | 775,255 |
| Western rivers | 1,484 | 213,384 |
| Porto Rico | 60 | 7,438 |
| Hawaiian Islands | 61 | 31,322 |

Porto Rico shows an increase of seven vessels, while the Hawaiian Islands show a decrease of eight. From the northern lakes thirty-five vessels were withdrawn, though the total tonnage increased by 116,510 tons. On the Pacific coast thirty-three less vessels, but only 604 less tons. For the Atlantic and Gulf coasts the increase was 112 vessels and 95,217 tonnage. Western rivers have a vessel increase of ninety, but a tonnage decrease of 1,711 tonnage. These decreases look bad. They are un-American.

During 1904 our vessel construction was:

| | Number. | Gross tonnage. |
|------------------------------|---------|----------------|
| Atlantic and Gulf ports..... | 702 | 186,680 |
| Northern lakes | 119 | 159,433 |
| Pacific coast | 176 | 21,608 |
| Western rivers | 187 | 10,821 |
| Totals | 1,184 | 378,542 |

In this table the sad, bad fact stands out prominently we did not build, in 1904 (nor in 1903) a single vessel for foreign trade, and this is the fact of the further fact that our foreign commerce for each year amounted to about \$2,500,000,000.

Query: How many millions of dollars for freight money did we transfer from American to foreign pockets in each of those years?

The slight increase, 9,992 tons, in American tonnage registered for foreign trade, includes vessels for the whale fisheries.

On the point of American tonnage registered for foreign trade, Commissioner Chamberlain notes a slight (very slight) improvement. He says: "The increase in registered tonnage for four years is not large (72,084 tons), but the increase in efficiency, due to the changes from sail to steam, is considerable. It is reflected in our trade returns, the percentage of exports and imports carried in American vessels last year being 10.3 per cent, compared with 9.3 per cent in 1900." Just think of it! An American carrying increase of only 1 per cent in four years, or one-fourth of one per cent a year. Talk about

American progress! Why, at that rate of progress (?) a tortoise would be a Derby winner compared with our chances against Great Britain, Germany, Japan, or any other ship building and ship owning nation in the race for foreign trade.

There is one other bright spot on the dark roll. The average size of American vessels engaged in foreign trade has increased since 1900. Steam vessels show an increased average tonnage of 582 each, while sailing vessels average 86 tons each less. In this part of our four years ship building work the roll of honor consists of the following ships:

| | Gross tons |
|------------------------------------|------------|
| Minnesota and Dakota, each | 20,718 |
| Manchuria and Mongolia, each | 13,938 |
| Finland and Kroonland, each | 12,670 |
| Korea and Siberia, each..... | 11,276 |

These are vessels to be proud of but we need many more of them; and we shall get them if congress does its duty in connection with the Merchant Marine Commission report. It must be borne in mind that we have to face an annual decrease in registered sail tonnage. Our year's construction of 1,184 vessels, of 378,542 gross tons, is an increase of 73 vessels of 57,910 tons, over the construction of 1903.

Commissioner Chamberlain significantly says: "The Minnesota and Dakota, if forerunners of similar steamers, would foretell the predominance of American merchant shipping on the Pacific. Under present conditions, however, such other steamers are not likely to be built." The president of the Great Northern railroad, Mr. James J. Hill, has stated:

"I had an experience in the building of two very large ships (Minnesota and Dakota), and I am quite sure I do not want any more. They are the two largest freight carrying ships in the world. We expected to finish them in two years, and it has taken nearly four, strikes and other difficulties following one another. I would rather undertake to build a thousand miles of railroad than two ships."

Mr. Hill's reference to strikes as delaying ship building is a pregnant remark. We are demanding of congress protection for our ship building industry. When we get that, as we will, the revival of the industry will rest entirely with ship building workers. If they then fritter away their birthright for such a mess of pottage as strikes, then they will only have themselves to blame for a continuance of the present bad conditions in that industry. The remark and its lesson applies with equal force to workers in all lines of industry kindred to ship building. "There is no work in sight at present, when the Missouri is completed, to take its place in furnishing employment to labor and capital in the seaboard shipyards," says the commissioner.

In a few short years, if our energetic president has his way, the American Panama canal will be open for traffic. Are we to operate it entirely for the benefit of foreign ships or mainly as a highway through which American ships can rapidly reach and grasp the vast trade of the mystic East? Let congress answer.

Anent the discussion which has been engendered as a result of the recent "flareback" accident on the United States battleship Maine while engaged in target practice, it may be explained that following the similar accident on the battleship Missouri some months ago the department took steps to install, as rapidly as possible, in connection with every piece of heavy ordnance now in use in the navy, a device which, it is claimed, will preclude the possibility of a recurrence of such accidents. Described in a nut-shell the new apparatus may be said to consist of three tubes which enter the breech of the gun in such a manner that when the breech block is swung open compressed air is driven through the bore of the gun with force sufficient to drive out all gases and remaining sparks. The device works automatically and in official tests appeared to demonstrate entire practicality.



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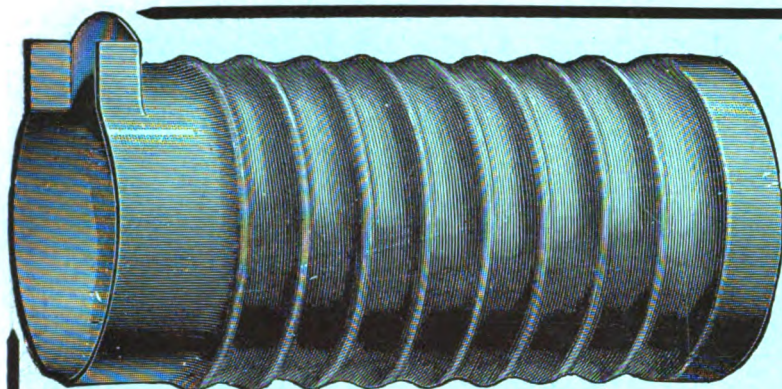
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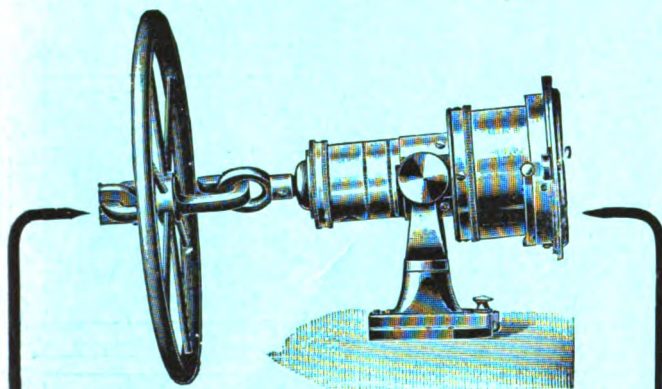
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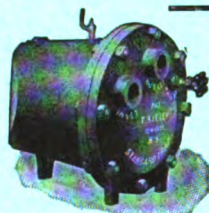
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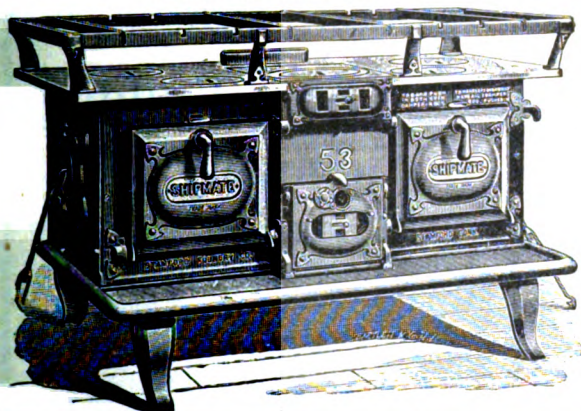
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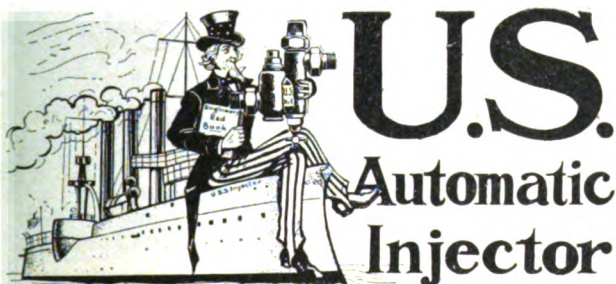
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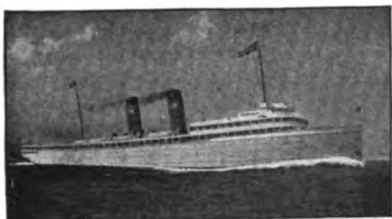
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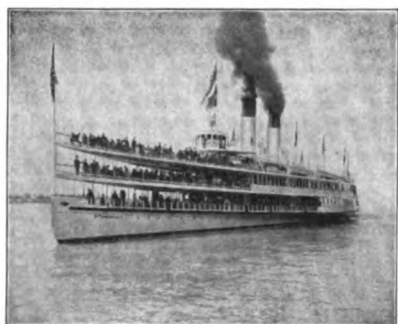
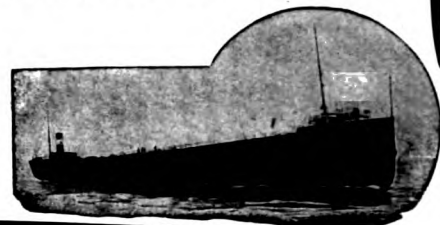
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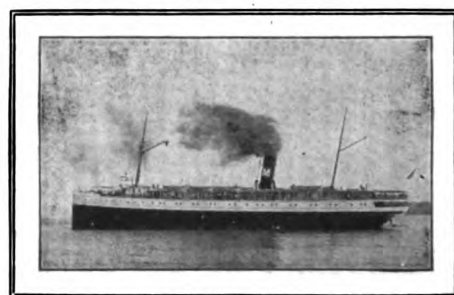
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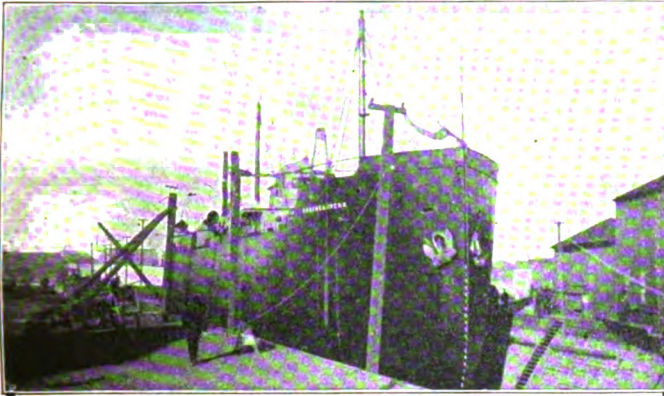
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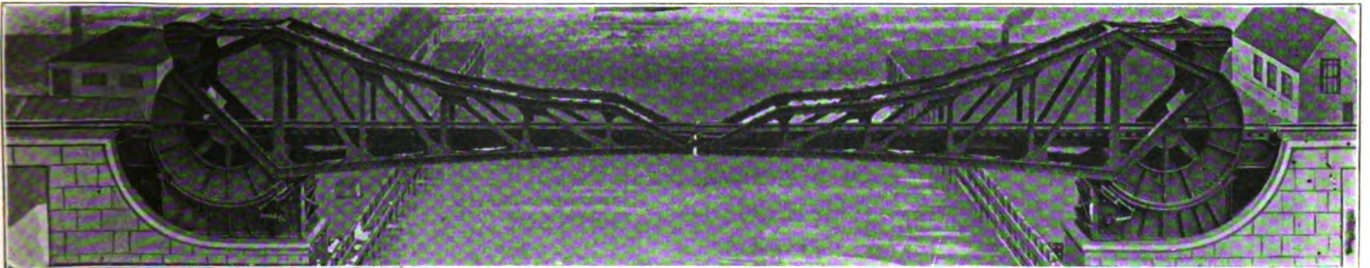
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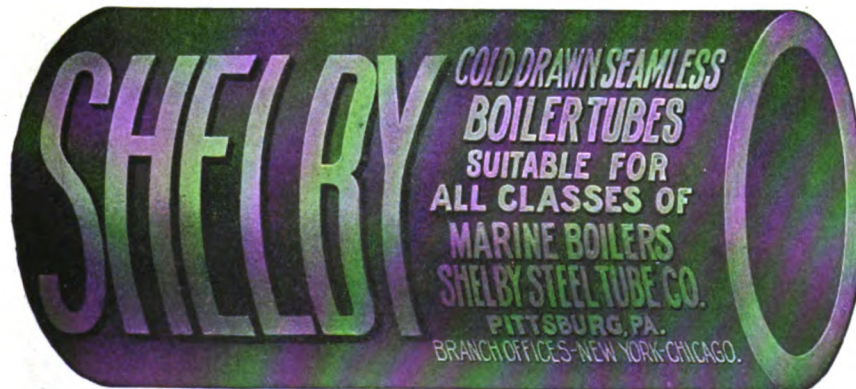


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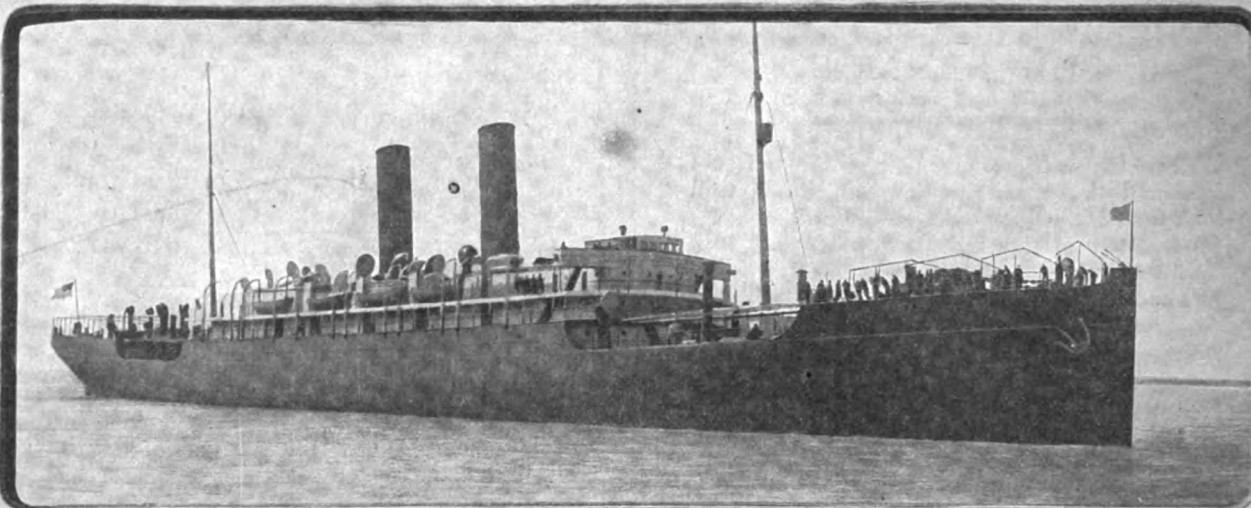
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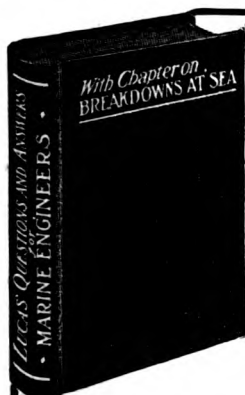
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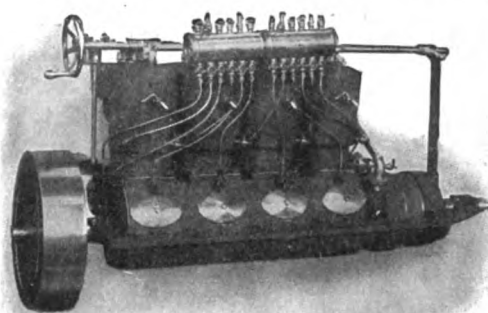
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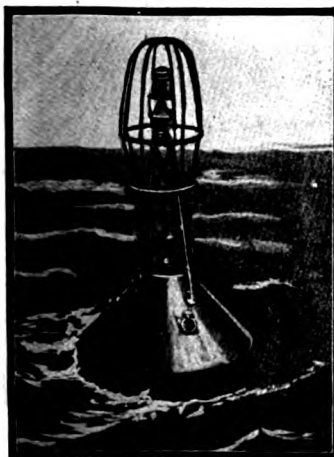
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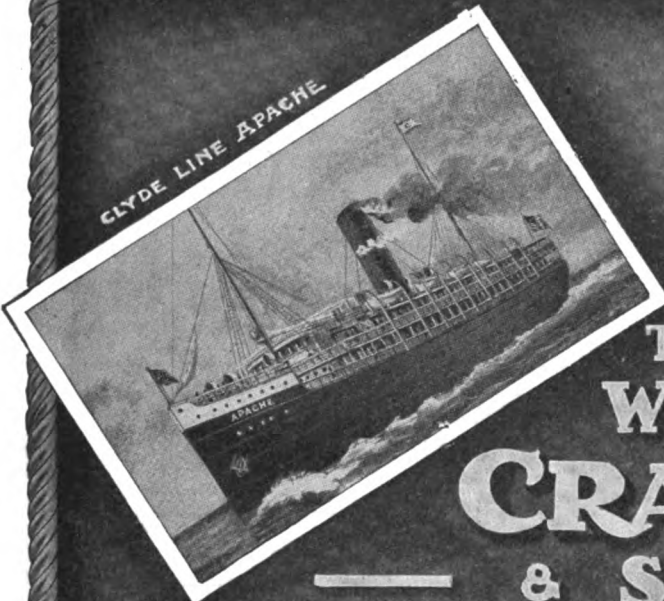
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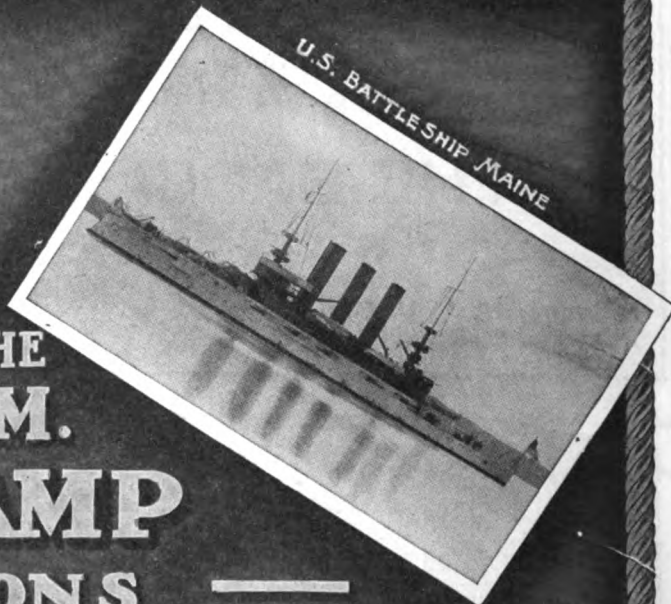
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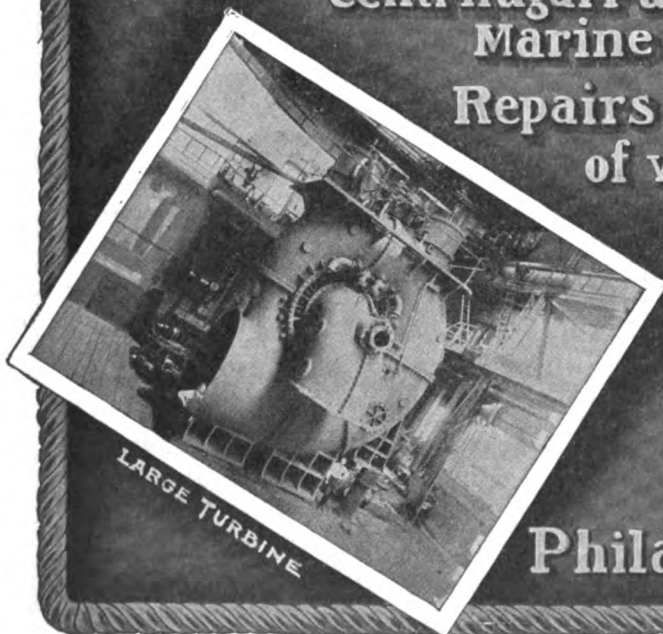


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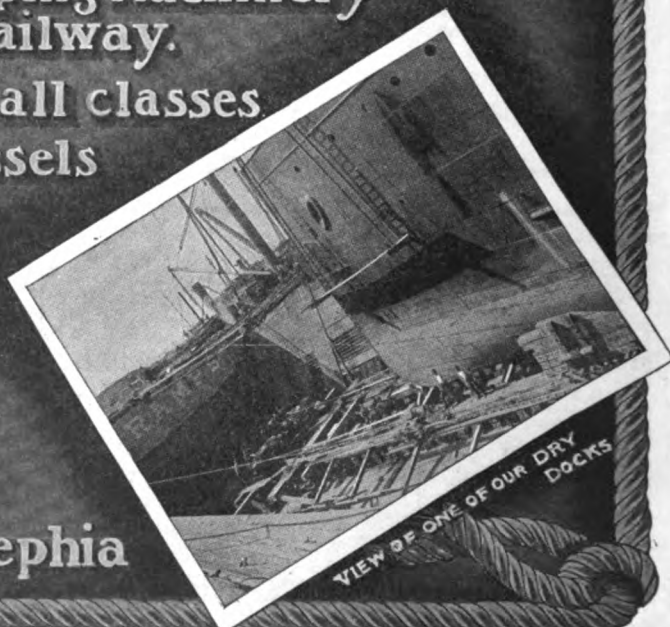
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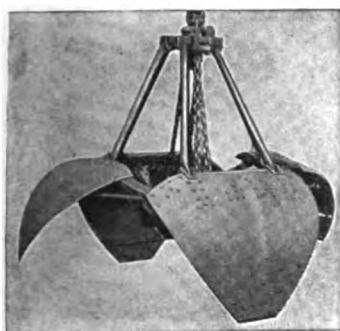
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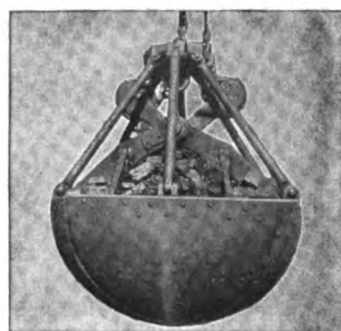
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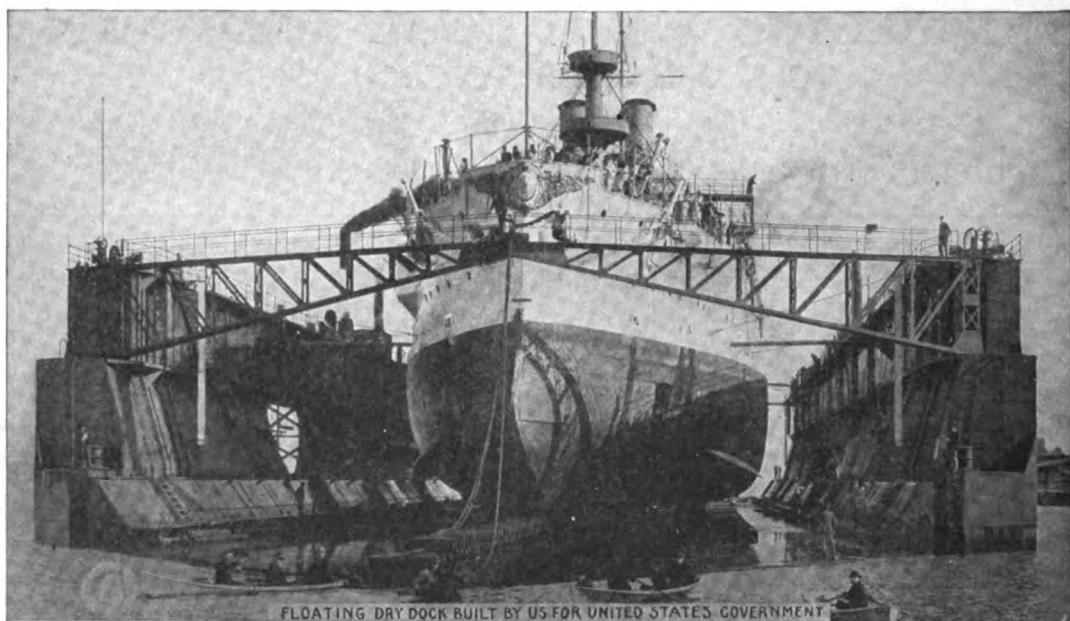
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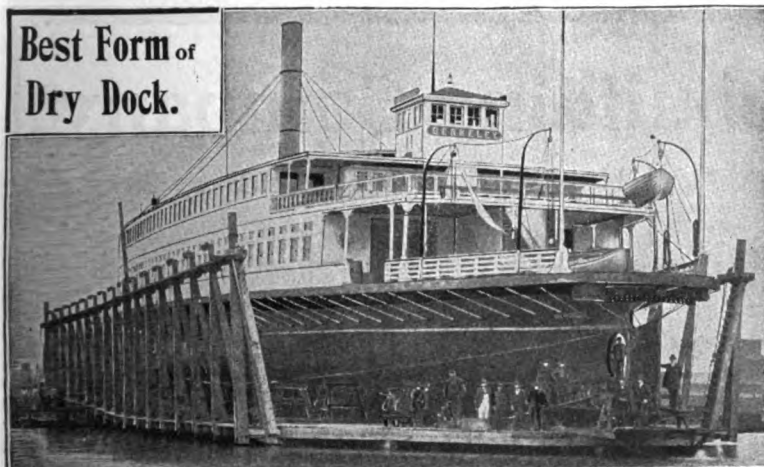
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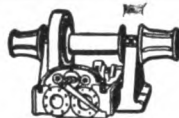
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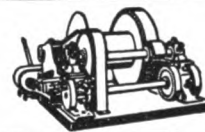
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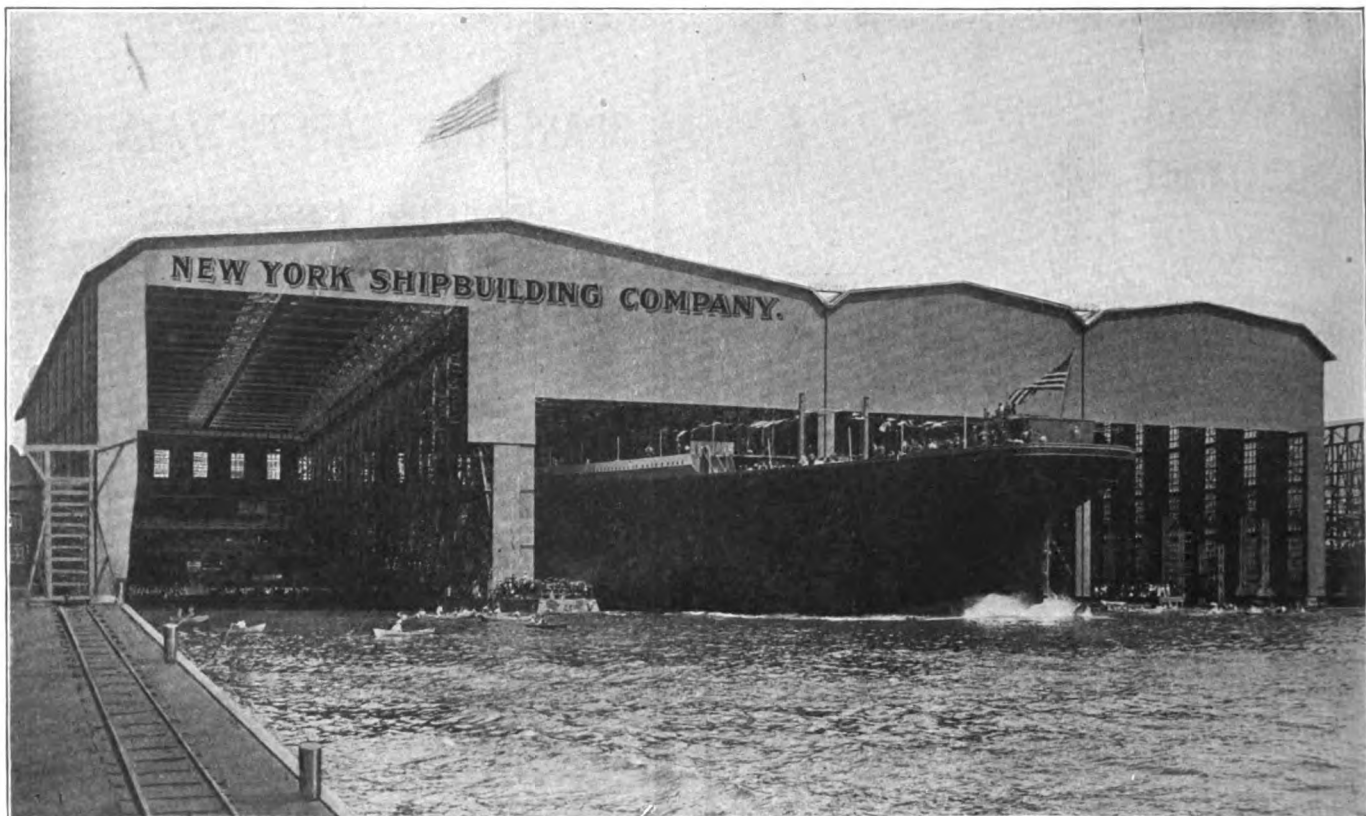
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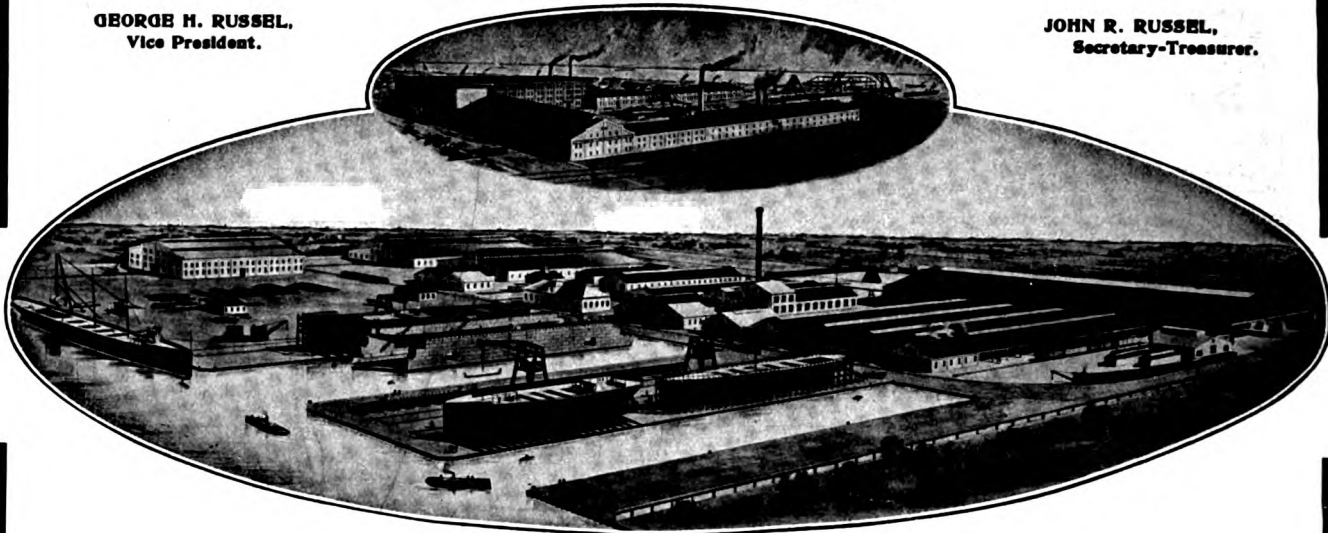
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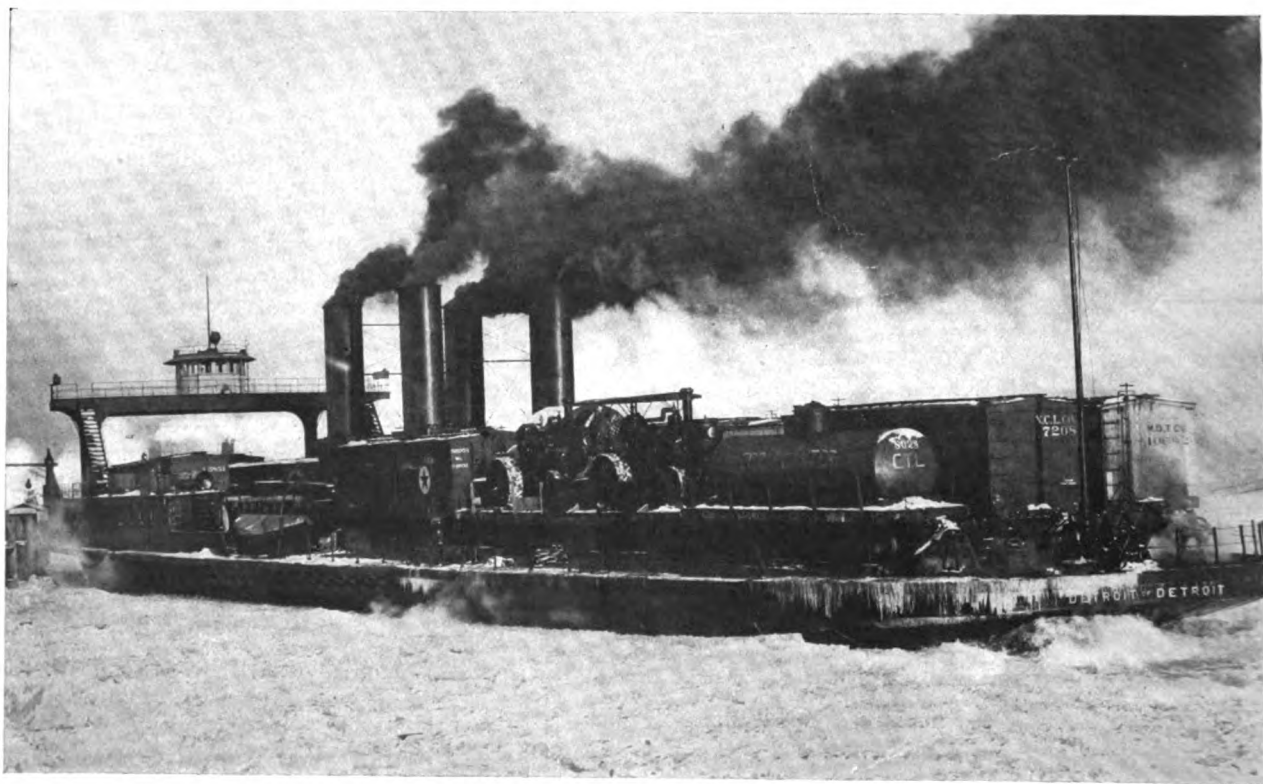
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Sturtevant, B. F. & Co.....Hyde Park, Mass.
Thropp & Sons, John E.....Trenton, N. J.

WANTED and FOR SALE Department.

PROPOSALS.

U. S. ENGINEER OFFICE.—Grand Rapids, Mich., May 3, 1905. Sealed proposals for excavating new channel from Kalamazoo River to Lake Michigan will be received here until 3 p. m., June 2, 1905, and then publicly opened. Information furnished on application. **M. B. ADAMS, Col., Engrs.** May 25

U. S. Engineer Office, Galveston, Tex., May 1, 1905.—Sealed proposals, in triplicate, for suction dredge, will be received here until 12 m., May 31, 1905, and then publicly opened. Information furnished on application. **Edgar Jadwin, Capt., Engrs.** May 25

U. S. Engineer Office, Buffalo, N. Y., April 29, 1905.—Sealed proposals for construction of stone superstructure and sea slope, and for stone riprap, on South Harbor section of Buffalo breakwater, will be received here until 11 a. m. May 29, 1905, and then opened. Information furnished on application. **H. M. Adams, Lieut. Col. Engrs.** May 25

PROPOSALS FOR SHEATHING BREAKWATER.—U. S. Engineer Office, 262 Huron Street, Cleveland, Ohio, May 19, 1905. Sealed proposals for sheathing the harbor face of the West Breakwater at Cleveland Harbor, Ohio, will be received at this office until 2 P. M. May 29, 1905, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. **DAN C. KINGMAN, Lieut. Col. Corps of Engineers, U. S. A.** May 25

U. S. Engineer Office, Buffalo, N. Y., May 6, 1905. Sealed proposals for channel excavation at Ogdensburg Harbor, N. Y., will be received here until 11 A. M., June 6, 1905, and then opened. Information furnished on application. **H. M. Adams, Lieut. Col. Engrs.** June 1

PROPOSALS FOR REPAIR OF JETTIES.—U. S. Engineer Office, 262 Huron Street, Cleveland, Ohio, May 8, 1905. Sealed proposals for Stone Reinforcement and Repair of Jetties at the harbors of Port Clinton, and Vermilion, Ohio, will be received at this office until 2 P. M., June 8, 1905, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. **DAN C. KINGMAN, Lieut. Col. Corps of Engineers, U. S. A.** June 1

PROPOSALS FOR DREDGING.—U. S. Engineer Office, 262 Huron Street, Cleveland, Ohio, May 5, 1905. Sealed proposals for dredging in Sandusky Harbor, Ohio, will be received at this office until 2 P. M., Standard Time, June 5, 1905, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. **DAN C. KINGMAN, Lieut. Col. Corps of Engineers, U. S. A.** June 1

U. S. Engineer Office, Duluth, Minn., May 4, 1905. Sealed proposals for pier work at Port Wing, Wis., will be received here until noon, June 5, 1905, and then publicly opened. Information on application. **Chas. L. Potter, Major, Engrs.** June 1

U. S. Engineer Office, Detroit, Mich., May 11, 1905. Sealed proposals for building concrete superstructure on main pier at Harbor Beach harbor of refuge, Mich., will be received here until 12:00 M., June 10, 1905, and then publicly opened. Information furnished on application. **Lansing H. Beach, Major, Engrs.** June 8

U. S. Engineer Office, Jones Building, Detroit, Mich., May 22, 1905. Sealed proposals for hire of one dredging plant and one steam attack boat for use in St. Mary's River, Michigan, will be received here until 2 P. M. June 22, 1905, and then publicly opened. Information furnished on application. **CHAS. E. L. B. DAVIS, Lieut. Col., Engineers.** June 15

PROPOSALS.

PROPOSALS FOR CONSTRUCTING BREAKWATER.—U. S. Engineer Office, 262 Huron Street, Cleveland, Ohio, May 20, 1905. Sealed proposals for constructing the Shoreward End of the West Breakwater at Ashtabula Harbor, Ohio, will be received at this office until 2 P. M., June 19, 1905, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. **DAN C. KINGMAN, Lieut. Col. Corps of Engineers, U. S. A.** June 15

U. S. Engineer Office, Jones Building, Detroit, Mich., May 20, 1905. Sealed proposals for dredging in St. Mary's River, at Bayfield Shoal and Entrance Angle to Middle Neshbish, will be received here until 2 P. M., June 20, 1905, and then publicly opened. Information furnished on application. **CHAS. E. L. B. DAVIS, Lieut. Col. Engineers.** June 15

FOR SALE.

Patent on Valuable Nautical Invention.

A device in the form of an air buoy for definitely locating sunken vessels. Should the vessel sink upon which this buoy is placed, the buoy floats, and a line, made fast in a separate compartment, unreels until the vessel strikes bottom, thereby locating the exact position of the sunken vessel. This buoy is also adapted for use as a mooring buoy for yachts of all sizes, and for all floating property. It can be manufactured and sold for much less than any other buoy in use. Will sell the patent for cash or exchange for vessel or other property. Address, **Capt. J. Fred Tribble, 59 Broadway, Norwich, Conn.** t.f.

Tug Wm. Engel.

A first class fishing rig for sale. Tug suitable for fishing or towing. For further information write to **Thomas Mader, 81 Middle St., Kenosha, Wis.** t.f

Dredging Outfits for Sale.

Two dipper dredges one partly burned; two combination dipper and clam shell dredges; four tugs; dump scows; flat scows; dredging appliances. Complete business to be closed out. For particulars address **Carkin, Stickney & Cram, Detroit.** May 25

Lake Tug for Sale.

Tug Kate Williams—rebuilt 1901, rates 1½. Moored Manitowoc, Wis., where she may be inspected. For prices and terms address **Lake Shore Stone Co., Milwaukee, Wis.** May 25

Steamer A. A. Turner.

For Sale at a Bargain. **Patrick McTigue, No. 2 Taylor St., Cleveland, O.**

FOR SALE.

For Sale.

Ten shares of stock of Manitowoc Dry Dock Company, Manitowoc, Wis. Address **Box 80, Marine Review.** t.f.

The Steamer Gordon Campbell.

Burned on spar-deck—easy to cut down to lumber barge, to carry million feet. Machinery and boilers untouched. Hull untouched and in good condition. Boat in dry dock and thoroughly overhauled last summer. Can be seen in Chicago. Want best offer. Address **Room 613, 59 Dearborn St., Chicago.** t f

Tug Jim Pullar and Scow.

Tug—built in 1894; 61 ft. long; 15 ft. beam. Water tube boiler. Compound condensing engine. Strong and seaworthy.

Scow—five years old. Excellent construction; 132 ft. long; 29½ ft. wide at center, 26 ft. wide at ends. Platform style, with stake pockets.

Tug and Scow recently overhauled and are in good condition. May be seen at Washburn, Wis., dock.

Address, **Fowler-Jacobs Co., Fisher Building, Chicago.** t.f.

For Sale.

FOR SALE.—Electric dynamos, direct connected to engines, also search-lights for marine work; good condition; cheap. **JORDAN BROS., 74 Beekman St., New York.** April 27

To close estate will sacrifice 14 h. p.

Gasoline Cruising Yacht,

36 ft. over all 2 ft. 4 in. draught; built

one year. Also one **Cruising Yacht,**

triple expansion engines, 75 h. p. new

Roberts boiler, carry 30 people. Address

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For Sale—Steamboat 62 ft. long, 14 ft. wide, 5 ft. draught, built in 1902. At present used as a water and supply boat in New York harbor.

R. D. COOPER, Little Falls, N. Y. May 25.

WANTED.

Salesmen Wanted.

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Buyers' Directory of the Marine Trade.—Continued.

ENGINE BUILDERS, MARINE.

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 Atlantic Works.....East Boston, Mass.
 Bertram Engine Works Co., Ltd.....
Toronto, Can.
 Chicago Ship Building Co.....Chicago.
 Chase Machine Co.....Cleveland.
 Cramp, Wm. & Sons.....Philadelphia.
 Craig Ship Building Co.....Toledo, O.
 Dake Engine Co.....Grand Haven, Mich.
 Detroit Ship Building Co.....Detroit.
 Fletcher, W. & A. Co.....Hoboken, N. J.
 Fore River Shipbuilding Co.....Quincy, Mass.
 Great Lakes Engineering Works.....Detroit, Mich.
 Hall Bros.....Philadelphia.
 Lockwood Mfg. Co.....East Boston, Mass.
 Marine Iron Works.....Chicago.
 Maryland Steel Co.....Sparrows Point, Md.
 Mietz, Aug.....New York.
 Milwaukee Dry Dock Co.....Milwaukee.
 Mosher, Chas. D.....New York.
 Moulton Steering Engine Co.....New York.
 Newport News Ship Building Co.....Newport News, Va.
 New York Shipbuilding Co.....Camden, N. J.
 Northwestern Steam Boiler & Mfg. Co.....
Duluth, Mich.
 Roach's Ship Yard.....Chester, Pa.
 Sheriffs Mfg. Co.....Milwaukee.
 Superior Ship Building Co.....Superior, Wis.
 Thropp, J. E. & Sons Co.....Trenton, N. J.
 Trout, H. G.....Buffalo.
 Willard, Chas. P. & Co.....Winthrop Harbor, Ill.

ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.

Cory, Chas. & Son.....New York.
 Marine Mfg. Supply Co.....New York.

ENGINE TESTING.

Kreer & Parsons.....Chicago.

ENGINEERING SPECIALTIES AND SUPPLIES.

Crane Co.....Chicago.
 Kieley & Mueller.....New York.
 Lunkenheimer Co.....Cincinnati.
 New York Belting & Packing Co.....New York.
 Northwestern Steam Boiler & Mfg. Co.....
Duluth, Minn.

ENGINEERS, MARINE, MECHANICAL, CONSULTING.

Hynd, Alexander.....Cleveland.
 Hunt, Robt. W. & Co.....Chicago.
 Kidd, Joseph.....Duluth, Minn.
 Kreer & Parsons.....Chicago.
 Lovejoy, H. O.....Buffalo.
 Mosher, Chas. D.....New York.
 Nacey, James.....Cleveland.
 Rice, Henry.....Buffalo.
 Roelker, H. B.....New York.
 Wood, W. J.....Chicago.

FANS FOR VENTILATION, EXHAUST, ETC.

Sturtevant, B. F. Co.....Hyde Park, Mass.

FEED WATER PURIFIERS AND HEATERS.

Greacen-Derby Engineering Co.....
Perth Amboy, N. J.
 Ross Valve Co.....Troy, N. Y.

FIXTURES FOR LAMPS, OIL OR ELECTRIC.

General Electric Co.....Schenectady, N. Y.

FORGES.

Sturtevant, B. F. Co.....Boston.

FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.

Cleveland City Forge & Iron Co.....Cleveland.
 Fore River Shipbuilding Co.....Quincy, Mass.
 Macbeth Iron Co.....Cleveland.

FLUE WELDING.

Fix's, S. Sons.....Cleveland.

FUEL ECONOMIZERS.

Sturtevant Co., B. F.....Hyde Park, Mass.

FUELING COMPANIES AND COAL DEALERS.

Hanna, M. A. & Co.....Cleveland.
 Ironville Dock & Coal Co.....Toledo, O.
 Parker Bros. Co., Ltd.....Detroit.
 Pickands, Mather & Co.....Cleveland.
 Pittsburgh Coal Co.....Cleveland.
 Smith, Stanley B., & Co.....Detroit.
 Smith Coal & Dock Co., Stanley B. Toledo, O.

FUELING PLANTS, BUILDERS OF

Link Belt Machinery Co.....Chicago.

FURNACES FOR BOILERS.

Continental Iron Works.....New York.

GAS BUOYS.

Safety Car Heating & Lighting Co.....New York.

GAS AND GASOLINE ENGINES.

Chase Machine Co.....Cleveland.
 Georgian Bay Engineering Works.....
Midland, Ont.

GAUGES, STEAM AND VACUUM.

Ashton Valve Co.....Boston.
 Lunkenheimer Co.....Cincinnati.

GAUGES, WATER.

Bonner & Co., Wm. T.....Boston.
 Lunkenheimer Co.....Cincinnati, O.

GRAPHITE.

Dixon Crucible Co., Joseph.....Jersey City, N. J.

GREASE EXTRACTORS.

Greacen-Derby Engineering Co.....
Perth Amboy, N. J.

HAMMERS, STEAM.

Chase Machine Co.....Cleveland.

HEATING APPARATUS.

Sturtevant, B. F. Co.....Hyde Park, Mass.

HOISTS FOR CARGO, ETC.

American Ship Building Co.....Cleveland.
 Brown Hoisting Machinery Co. (Inc.).....
Cleveland.
 Chase Machine Co.....Cleveland.
 General Electric Co.....New York.
 Georgian Bay Engineering Works.....
Midland, Ont.
 Hyde Windlass Co.....Bath, Me.
 McMyler Mfg. Co.....Cleveland.
 Marine Iron Co.....Bay City.
 Mietz, Aug.....New York.

HOLLOW STAYBOLT IRON.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

HOSE, RUBBER.

New York Belting & Packing Co.....New York.

HYDRAULIC DREDGES.

Great Lakes Engineering Works.....Detroit.

HYDRAULIC TOOLS.

Watson-Stillman Co., The.....New York.

ICE MACHINERY.

Great Lakes Engineering Works.....Detroit.
 Roelker, H. B.....New York.

INDICATORS FOR STEAM ENGINES.

Ashton Valve Co.....Boston.

INJECTORS.

American Injector Co.....Detroit.
 Crane Co.....Chicago.
 Jenkins Bros.....New York.
 Lunkenheimer Co.....Cincinnati.
 Penberthy Injector Co.....Detroit, Mich.

INSURANCE, MARINE.

Elphicke, C. W. & Co.....Chicago.
 Fleming & Co., E. J.....Chicago.
 Gilchrist & Co., C. P.....Cleveland.
 Hawgood & Co., W. A.....Cleveland.
 Helm & Co., D. T.....Duluth.
 Hutchinson & Co.....Cleveland.
 McCarthy, T. R.....Montreal.
 McCurdy, Geo. L.....Chicago.
 Mitchell & Co.....Cleveland.
 Parker Bros. Co., Ltd.....Detroit.
 Peck, Chas. E. & W. F.....New York & Chicago.
 Prindiville & Co.....Chicago.
 Richardson, W. C.....Cleveland.
 Sullivan, D. & Co.....Chicago.

IRON ORE AND PIG IRON.

Bourne-Fuller Co.....Cleveland, O.
 Hanna, M. A. & Co.....Cleveland.
 Pickands, Mather & Co.....Cleveland.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

Georgian Bay Engineering Works.....
Midland, Ont.
 Marine Iron Works.....Chicago.
 Truscott Boat Mfg. Co.....St. Joseph, Mich.
 Willard, Chas. P.....Winthrop Harbor, Ill.

LIFE PRESERVERS, LIFE BOATS, BUOYS.

Armstrong, Cork Co.....Pittsburg.
 Drein, Thos. & Son.....Wilmington, Del.
 Gaynor, T. F.....New York.
 Kahnweiler's Sons, D.....New York.
 National Cork Co.....Brooklyn.

LIGHTS, SIDE AND SIGNAL.

Russell & Watson.....Buffalo.

LOGS.

Nicholson Ship Log Co.....Cleveland.
 Walker & Sons, Thomas.....Birmingham, Eng.
 Also Ship Chandlers.

LUBRICATING GRAPHITE.

Dixon Crucible Co., Joseph.....Jersey City, N. J.

LUBRICATORS.

Crane Co.....Chicago.
 Lunkenheimer Co.....Cincinnati.

LUMBER.

Martin-Barriss Co.....Cleveland.

MACHINISTS.

Chase Machine Co.....Cleveland.
 Hickler Bros.....Sault Ste. Marie, Mich.
 Lockwood Mfg. Co.....East Boston, Mass.

MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc.....Philadelphia.

MARINE RAILWAYS.

Hickler Bros.....Sault Ste. Marie, Mich.

MARINE RAILWAYS, BUILDERS OF.

Crandall & Son, H. I.....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W.....New York.

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American Ship Building Co.....Cleveland.
 Detroit Ship Building Co.....Detroit.
 Great Lakes Engineering Works.....Detroit.
 Sturtevant, B. F. Co.....Hyde Park, Mass.

METALLIC PACKING.

Katzenstein, L. & Co.....New York.

METAL POLISH.

Bertram's Oil Polish Co.....Boston.

MOTORS, GENERATORS—ELECTRIC.

Fisher Electrical Works.....Detroit.
 General Electric Co.....Schenectady, N. Y.
 Sturtevant, B. F. Co.....Hyde Park, Mass.

NAUTICAL INSTRUMENTS.

Ritchie, E. S., & Sons.....Brookline, Mass.

NAVAL ARCHITECTS.

Hynd, Alexander.....Cleveland.
 Kidd, Joseph.....Duluth, Minn.
 Kreer & Parsons.....Chicago.
 Lovejoy, H. O.....Buffalo.
 Matteson & Drake.....Philadelphia.
 Mosher, Chas. D.....New York.
 Nacey, James.....Cleveland.
 Rice, Henry.....Buffalo.
 Wood, W. J.....Chicago.

OAKUM.

Stratford, Oakum Co.....Jersey City, N. J.

OIL ENGINES.

Mietz, Aug.....New York.

OILS AND LUBRICANTS.

Dixon Crucible Co., Joseph.....Jersey City, N. J.
 Standard Oil Co.....Cleveland.

PACKING.

Crane Co.....Chicago.
 Jenkins Bros.....New York.
 Katzenstein, L. & Co.....New York.
 New York Belting & Packing Co.....New York.

PAINTS.

Baker, Howard H. & Co.....Buffalo.
 Upson-Walton Co.....Cleveland.

PATTERN SHOP MACHINERY.

Atlantic Works, Inc.....Philadelphia.

WANTED and FOR SALE Department Continued.

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FOR SALE—Length 78 ft., beam 18 ft., triple expansion engines, water-tube boiler, allowed 200 lbs.; electric light, search light, mahogany deck-house 9 x 16, power launch, complete outfit, all in first-class condition. One of the best family cruising yachts on the Lakes. Inquire Wickes Bros., Saginaw, Mich. tf

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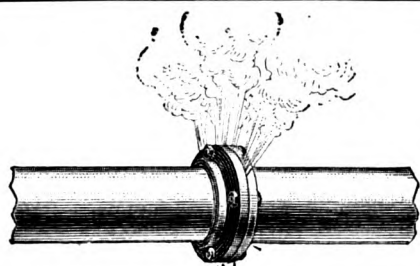
This up-to-date Gasoline Yacht 65x9½, mahogany finished throughout; large cabin, plate glass windows, mahogany blinds; fine carpets and upholstery; excellent electric light plant—dynamo, storage batteries and search light. Entire boat can be easily converted into cabin if desired.

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will stop leaks like the above with steam on. Write us about it.

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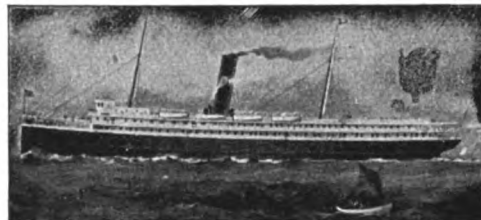
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DURABLE**

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BUILDERS OF

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Marine Engines, Boilers and Tanks.

Heavy Machinery and Plate Iron Work.

THREE MARINE RAILWAYS.

Buyers' Directory of the Marine Trade.—Continued.

PILE DRIVING AND SUBMARINE WORK.

Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co.
.....Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros.....Sault Ste. Marie, Mich.
Lake Superior Contracting & Dredging Co.
.....Duluth, Minn.
Parker Bros. Co., Ltd.....Detroit.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H.....Milwaukee.
Sullivan, M.....Detroit

PIPE, WROUGHT IRON.

Bourne-Fuller Co.....Cleveland, O.
Crane Co.....Chicago.
Macbeth Iron Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

PLANING MILL MACHINERY.

Atlantic Works, Inc.....Philadelphia.

PLATES—SHIP, STRUCTURAL, ETC.

Bourne-Fuller Co.....Cleveland, O.
Otis Steel Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

PRESSURE REGULATORS.

Kieley & Mueller.....New York.
Ross Valve Co.....Troy, N. Y.

PROPELLER WHEELS.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Hyde Windlass Co.....Bath, Me.
Lockwood Mfg. Co.....East Boston, Mass.
Marine Iron Works.....Chicago.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....Newport News, Va.
Roelker, H. B.....New York.
Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co.....Superior, Wis.
Thropp & Sons Co., J. E.....Trenton, N. J.
Trout, H. G.....Buffalo.

PROJECTORS, ELECTRIC.

General Electric Co.....Schenectady, N. Y.

PUMPS FOR VARIOUS PURPOSES.

Blake, Geo. F., Mfg. Co.....New York.
Great Lakes Engineering Works.....Detroit.
Marine Iron Works.....Chicago.
Kingsford Foundry & Machine Works.....Oswego, N. Y.

RANGES.

Stamford Foundry Co.....Stamford, Conn.

REFRIGERATING APPARATUS.

Great Lakes Engineering Works.....Detroit.
Roelker, H. B.....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes Register.....Cleveland.

REPAIRS—ENGINE AND BOILER.

(See also Boiler Manufacturers and Engine Builders.)
Georgian Bay Engineering Works.....Midland, Ont.

RIVETS, STEEL FOR SHIPS AND BOILERS.

Bourne-Fuller Co.....Cleveland, O.

SAFETY VALVES.

Ashton Valve Co.....Boston.
Crane Co.....Chicago.
Lunkenheimer Co.....Cincinnati.

SAIL MAKERS.

Baker, Howard H. & Co.....Buffalo.
Upson-Walton Co.....Cleveland.

SALVAGE COMPANIES.

See Wrecking Companies.

SEARCH LIGHTS.

General Electric Co.....Schenectady, N. Y.

SHEARS.

See Punches, Rivets, and Shears.

SHIP AND BOILER PLATES AND SHAPES.

Bourne-Fuller Co.....Cleveland, O.
Otis Steel Co.....Cleveland.

SHIP BUILDERS.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Bertram Engine Works Co., Ltd.....Toronto, Can.
Buffalo Dry Dock Co.....Buffalo.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Chicago Ship Building Co.....Chicago.
Detroit Ship Building Co.....Detroit.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Lockwood Mfg. Co.....East Boston, Mass.
Maryland Steel Co.....Sparrows Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....Newport News, Va.
New York Shipbuilding Co.....Camden, N. J.
Roach's Ship Yard.....Chester, Pa.
Shipowner's Dry Dock Co.....Chicago.
Smith & Son, Abram.....Algonac, Mich.
Willard, Chas. P. & Co. Winthrop Harbor, Ill.

SHIP CHANDLERS.

Baker, Howard H. & Co.....Buffalo.
Marine Mfg. & Supply Co.....New York.
Upson-Walton Co.....Cleveland.

SHIP DESIGNERS.

Kidd, Joseph.....Duluth.
Kreer & Parsons.....Chicago.
Matteson & Drake.....Buffalo.
Rice & Lovejoy.....Buffalo.
Steel, Nacey & Hynd.....Cleveland.
Wood, W. J.....Chicago.

SHIP LANTERNS AND LAMPS.

Russell & Watson.....Buffalo.

SHIPMATE RANGES.

Stamford Foundry Co.....Stamford, Conn.

SHIP TIMBER.

Martin-Barriss Co.....Cleveland.

SMOOTH-ON COMPOUND, FOR REPAIRS.

Smooth-On Mfg. Co.....Jersey City, N. J.

STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.
Reading Iron Co.....Reading, Pa.

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Holmes, Samuel.....New York.
Lester, S. S.....Quebec, Can.
McCarthy, T. R.....Montreal, Can.

STEAMSHIP LINES, PASS. AND FREIGHT.

American Line.....New York.
Anchor Line.....Buffalo.
Boston Steamship Co.....Boston.
International Mercantile Marine Co.....Philadelphia.
New York & Cuba Mail S. S. Co.....New York.
Red Star Line.....New York.
United Fruit Co.....Boston.

STEEL CASTINGS.

Otis Steel Co.....Cleveland.

STEERING APPARATUS.

American Ship Building Co.....Cleveland.
Chase Machine Co.....Cleveland.
Detroit Ship Building Co.....Detroit.
Hyde Windlass Co.....Bath, Me.
Marine Mfg. & Supply Co.....New York.
Moulton Steering Engine Co.....New York.
Sheriffs Mfg. Co.....Milwaukee.

SUBMARINE DIVING APPARATUS.

Morse & Son, A. J.....Boston.
Schrader's Son, A.....New York.

SURVEYORS, MARINE.

Gaskin, Edward.....Buffalo.
Hynd, Alexander.....Cleveland.
Lovejoy, H. O.....Buffalo.
Matteson & Drake.....Philadelphia.
Parker Bros. Co., Ltd.....Detroit.
Nacey, James.....Cleveland.
Rice, Henry.....Buffalo.
Steel, Adam.....Cleveland.
Wood, W. J.....Chicago.

TESTS OF MATERIALS.

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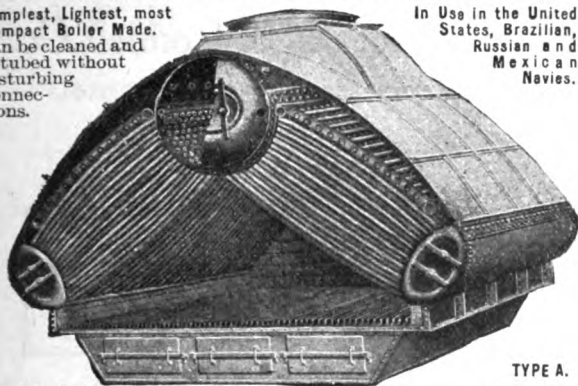
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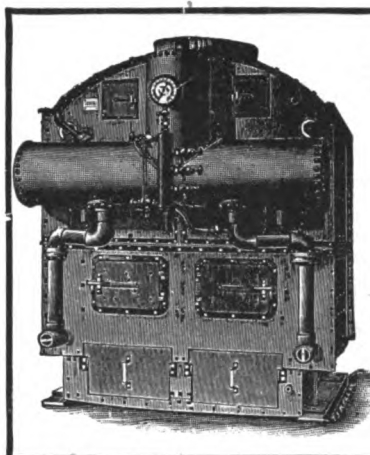
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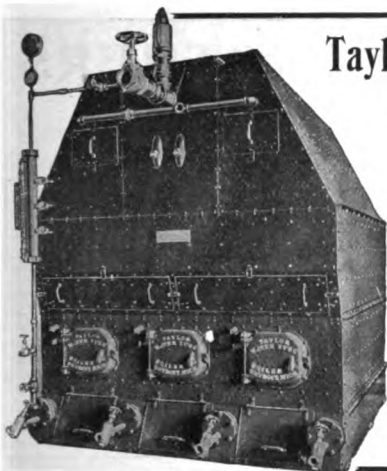
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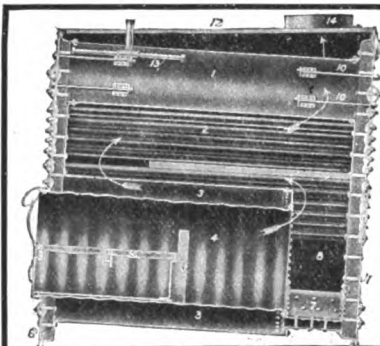
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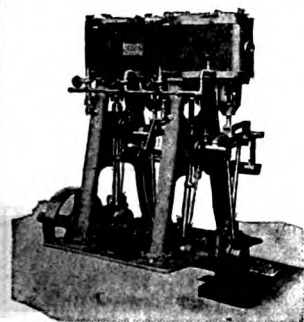
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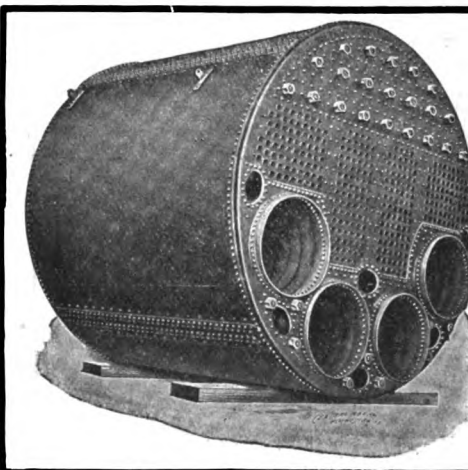
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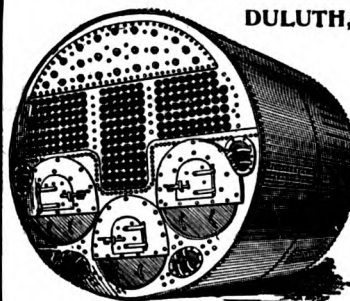
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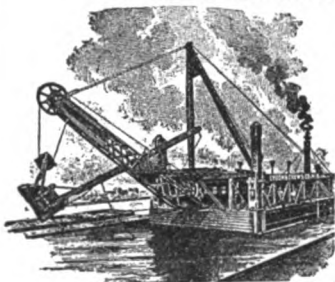
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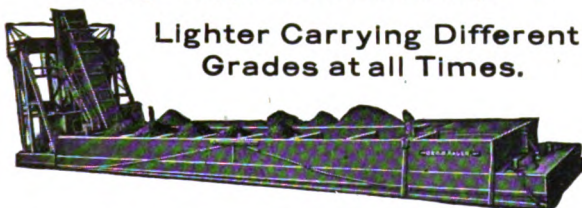
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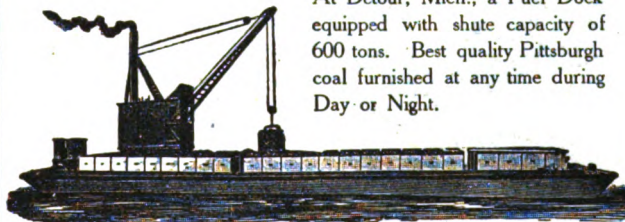
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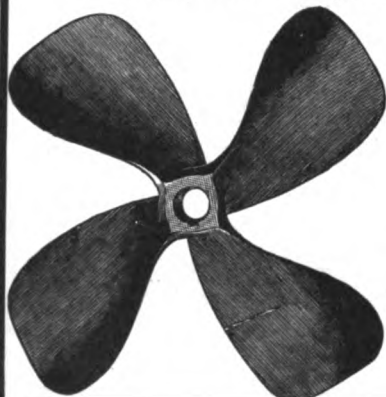
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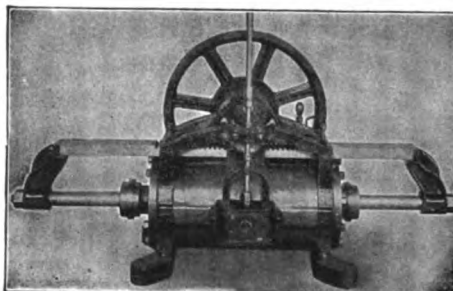
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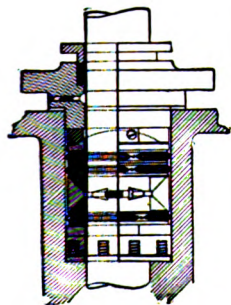
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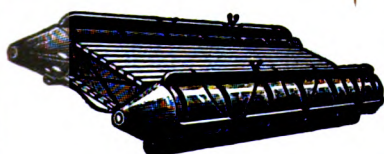
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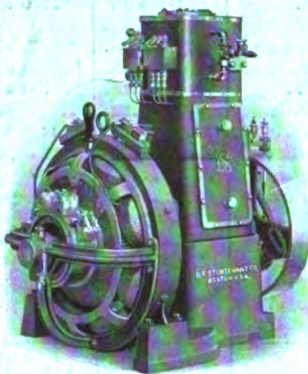
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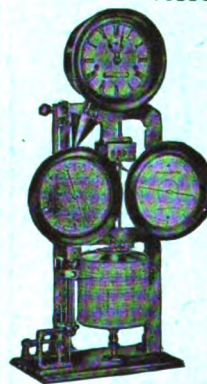


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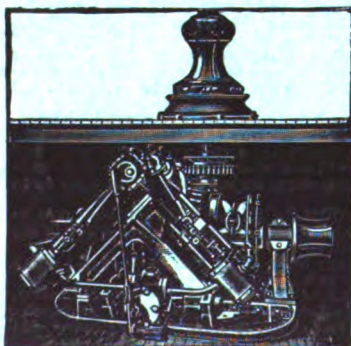
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